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MAGAZINE

## SCOOP!

- ◆ Mitsubishi 40-Inch Direct-View TV
- ◆ NHT Surround-Sound Speaker System
- ◆ Sharp 35-Inch TV/VCR

## DISC FACTOR

Digging Into the Digital Videodisc

## TROUBLESHOOTING

How to Improve Your Video Image

## AC-3 RETROFIT

Make Your LD Player a Digital Powerhouse





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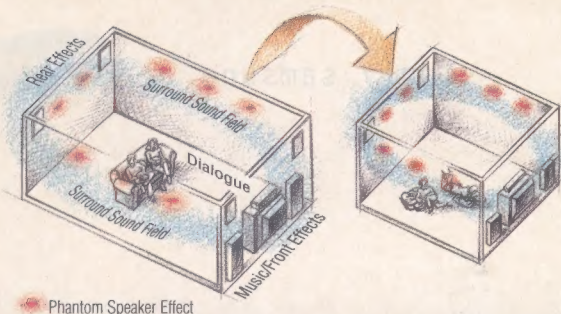


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OCTOBER 1995

# VIDEO

MAGAZINE



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**COVER PHOTO** Tony Cordoza



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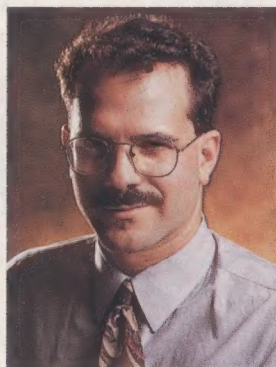
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## Split Decision



■ THE TIMES THEY ARE A-CHANGIN'. AND THE changes are profound, as rapid-fire technological advances seek to improve the products and services of the present even as they usher in a tidal wave of tantalizing new options and opportunities. It's natural to be both excited and overwhelmed by it all. ■ Digital technology is at the heart of most of these gyrations. Digital TV as seen in the DSS and Primestar DBS systems delivers tremendous flexibility, while the upcoming HDTV format promises a level of quality we haven't seen before. Digital videodiscs are expected to surpass laserdiscs on all quality and convenience fronts when they debut next year. D-VHS VCRs will be able to record any digital bit stream without degradation. AC-3 digital surround sound can give your living room the ambience of an Apollo capsule or the Batcave. The World Wide Web uses digital bits to link home PCs with computers all over the globe. And the digital camcorders debuting this month [see "Fast Forward," page 13] are designed to record images with a mere 500 lines of horizontal resolution. ■ Should you care? After all, it's not like LDs, Dolby Pro Logic, and current camcorders and VCRs are *bad*. Our advice: Feel free to go ga-ga when you read about the latest innovations, and then take a cold shower. Think rationally about your situation. Are you satisfied with the products you own? Or do you yearn for something better? ■ If you're content to simply sit back and enjoy the system you've built, we'll keep you up to date with the latest and greatest software that's making the scene—and in touch with the news that affects your options. If you're looking to upgrade, know that the possibilities are growing by the minute. Rest assured that we'll help you make sense of them all. ■

*Bill Wolfe*

# VIDEO

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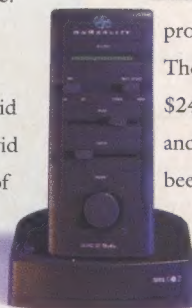
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## MAR TREK

I recently bought the THX laserdisc of *Star Trek Generations*, but when I tried to play it in my LD player, I got nothing but a horrible whine out of my system's right channel. Then I noticed some tiny text on the back of the jacket that told me about AC-3 encoding, which takes the place of the right channel—and that my choices were to switch to the PCM digital or mono mode. Well, my player doesn't have PCM digital audio, so now these wonderful new discs are giving me the worst sound available!

**Brian Ramsbey**  
Walkerton, IN

You've touted the introduction of Dolby Surround AC-3 ["Surrounded," September 1995], but I'm disturbed by the introduction of still another technology that degrades my current system. AC-3 is not completely backward-compatible. If it were, I'd still get stereo sound when I play these new discs on my non-digital laserdisc player. I won't knowingly buy any AC-3-encoded discs.

**David H. Sexton**  
Knoxville, TN

Not wanting to rent the tape version of *Star Trek Generations*, I pre-ordered the laserdisc version. I couldn't wait for it to arrive, and, when it did, I opened the package like a kid on Christmas morning. But as soon as I fired up my big-screen and slid the disc into my older player, a nasty whine came out of my right front channel! And there was no surround sound! Then I read the postage-stamp-size disclaimer on the back of the jacket. It really burns me that companies are forcing their customers to run out and spend a lot of money to keep up with their changing whims.

**Scott Richardson**  
Baltimore

*It's absolutely true that AC-3 is not completely backward-compatible, and it certainly isn't fair that owners of non-digital LD players are being penalized. AC-3 shouldn't be consider-*

*ed a whim, however—in all of the demonstrations we've heard, and in our own "Surrounded" evaluation, we found that it's a dramatic improvement.*

—Ed.

## COLD REMEDY

I was about to purchase an AC-3-ready A/V receiver, but I don't want to be left out in the cold. I've heard that the upcoming Toshiba/Time Warner digital videodiscs will be encoded with DTS—not AC-3, as was reported earlier. Would going with separates be the solution? Can any surround processor accept an AC-3 or other 5.1-channel digital processor?

**Tim Glover**  
Quinlan, TX

*It's a very good bet that both digital-videodisc standards will include AC-3; one or both may also accommodate DTS. AC-3 and/or DTS decoders can be built into any processor; currently, however, only AC-3 decoders are in the retail pipeline.*

—Ed.

## ARTIFACTS OF LIFE

Your comments on DVD and AC-3 ["Special Report," April 1995] uncritically parrot what the video industry says. You say that DVD will provide "laser-quality" pictures, and, regarding AC-3, you say that "viewers should get used to the notion of signal compression." No thank you! Even uncritical viewers will see MPEG-2 compression artifacts in DVD scenes with lots of detail and motion. And compression will ruin AC-3, too. For the indefi-

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nite future, I'll stick with the LD and Dolby Pro Logic.

**Ed Rudnicki**  
Wharton, NJ

*Considering where we are on the DVD development curve, it'd be premature to draw conclusions about its picture quality. And our initial forays into AC-3 revealed no artifacts; it's clearly superior to DPL.*

—Ed.

## DOLLAR BULL

In reference to "Eyes on the Prize" [July/August 1995], \$50 for a laserdisc is no bargain. As for the assertion that \$40 is a "reasonable" price point, even that figure stretches my wallet to the breaking point. For all the quality that the THX logo ensures, THX is the latest reason why the LD format will never become the major format that it richly deserves to be. As long as LD doesn't compete with VHS in terms of pricetags, it will remain pigeonholed in a tiny niche.

**Derek M. Germano**  
Editor, *The Cinema Laser*  
*The Laserdisc Collector's Companion*  
Commack, NY  
Dmgermano@delphi.com

*Due to its superior image and sound quality, it's reasonable for LD to be somewhat more expensive than VHS—though two to three times as expensive certainly is unreasonable.*

—Ed.

## TERMINATOR LIMITS

I've been collecting laserdiscs for about 5 years now, but I hadn't purchased *The Terminator* because it had mono sound and I'd seen a VHS copy with stereo sound. When I read that a THX LD version was going to



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be released, I was ecstatic, as I assumed that it would have a stereo soundtrack. Then I discovered that it, too, is mono. If the LD is the height of home-video excellence, why do I have to go to a VHS version to get better sound?

**Steve Smythe**  
Winnipeg

*The VHS version you mention has a synthesized stereo soundtrack taken from the film's original mono mix. As with most synthesized soundtracks, it really doesn't sound that good. THX decided to go with the superior mono soundtrack.*

—Ed.

## SECRET WORLD SECRET

Your review of Peter Gabriel's *Secret World Live* ["SoftWire," July/August 1995] was a cheap shot at one of the best artists of our time. Mr. Gabriel has owned up to doing some patching up in the studio, and said he didn't know of any artists who didn't do this. And my copy sounds fantastic.

**JV**  
Weehawken, NJ  
JoiGuen@aol.com

## COLE MINDER

I was offended by a comment made by Bob Cole in "The Big Show" ["Home Improvement," July/August 1995]. While the introduction does state that Barry Bronstein is the resident electronics buff, it doesn't ask you to assume that his wife Candy is a bimbo. The sentence, "Barry may be a techie, but Candy and the kids probably need something simpler" is inexcusable in its sexism. I think it's time for people to realize that women are as technically capable as men.

**Susan Weber, MLS**  
Media Librarian  
Langara College  
Vancouver

I enjoyed "The Big Show," though the advice given to the Bronsteins tends to be on the expensive side. I had a similar experience last year, as I wanted to improve my system, but didn't want to spend an excessive

amount of money. After shopping around for about a week, I found what I was looking for—components from Boston Acoustics, Infinity, and Yamaha—and now I'm very happy.

**Jerry Levy**  
New York

*The retailers' upgrades didn't exceed the budget the Bronsteins gave us.*

—Ed.

## CASSETTE FOR LIFE

Regarding Norm Strong's letter ["Progress Retort," "Feedback," June 1995], I was hoping to hear that someone, somewhere is making a decent VCR that I can use to edit tapes without seeing the VCR readouts on the finished product.

**Donald F. Welch**  
Olean, NY

I currently own three VCRs, all programmable from LCD remotes as well as the VCRs' front panels. The convenience is overwhelming: I can program anything, anytime, without disturbing someone watching something else or waiting for the TV to come on. If and when any of my VCRs need repair, I'll spend whatever it takes to keep them going rather than compromise on convenience and principle.

**Francis X. Dobler**  
Scottsdale, AZ

My Citizen JVHS 3490, which may appear under the Symphonic brand name in America, has a faceplate timer that can be set to start and stop anytime within the next 24 hours—you don't need a remote, and the TV doesn't have to be powered.

**Kevin McIntyre**  
Carrot River, Saskatchewan

## CORRECTION

In our test of the Mitsubishi M-V7057 LD player ["Video Test," July/August 1995], we errantly stated that the analog audio tracks on an AC-3-encoded laserdisc are handled in "standard" fashion. In fact, only the left analog channel remains, and it contains a mono signal.



# In The Mid '70s We Created Home Theater. Now We've Created A New Way To Buy It.

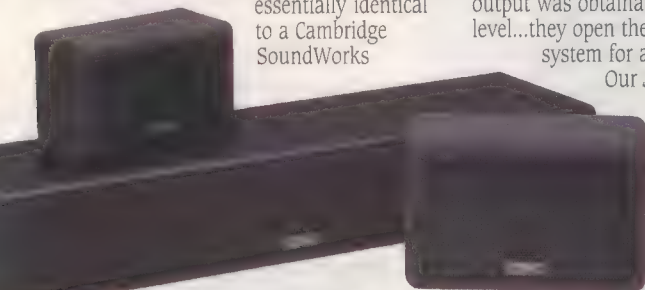
The people who work at Cambridge SoundWorks - including our cofounder Henry Kloss (who also founded AR, KLH and Advent) - have been involved with the concept of home theater from the beginning. In 1969 (years before VCRs and cable TV), Henry Kloss founded Advent, the company that introduced the first home theater audio/video systems - complete with big-screen TVs and digital surround sound. We have had an ongoing relationship with the people at Dolby Laboratories, creators of Dolby Surround Sound, since Henry Kloss introduced the first consumer products with Dolby noise reduction over 20 years ago. And now at Cambridge SoundWorks we believe we have set a new price-to-performance standard for home theater components.

Because we sell carefully matched and tested home theater speaker systems Factory-Direct, you can save hundreds of dollars. We believe the products on these pages represent the country's best values in high performance home theater components. Audio critics, and thousands of satisfied customers, agree. *Stereo Review* said, "Cambridge SoundWorks manufactures loudspeakers that provide exceptional sound quality at affordable prices." *Audio* suggested that we may have "the best value in the world."

## Center Channel Speakers

Cambridge SoundWorks manufactures three speakers for use as center channel speakers in Dolby Pro Logic home theater systems. All three are magnetically shielded so they can be placed near a TV or computer monitor. *Model Ten-A* is a small, affordable two-way speaker. **\$79<sup>99</sup>**. *Center Channel* is

essentially identical to a Cambridge SoundWorks



*Ensemble* satellite (but with magnetic shielding). **\$149<sup>99</sup>**. *Center Channel Plus* uses an ultra-low, ultra-wide design that is ideal for placement above (or, with optional support stand, below) a TV monitor. **\$219<sup>99</sup>**.

## Surround Speakers

Cambridge SoundWorks makes two "dipole radiator" surround sound speakers. Dolby Laboratories recommends dipole radiator speakers for use as surround speakers. *The*

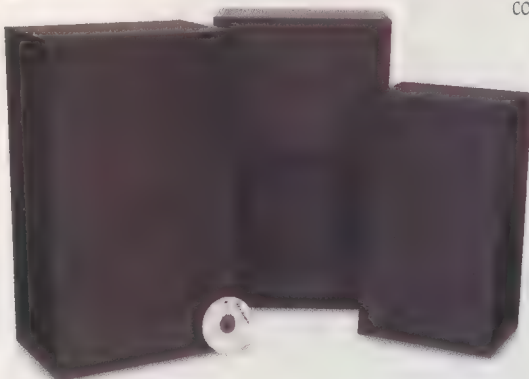


*Surround* has a very high power handling capacity and is often selected for "high end" surround sound systems. *Audio*, describing a system that included *The Surround* said,

"In many ways the surround sensation was every bit as good as far more expensive installations." **\$399<sup>99</sup> pr.** The smaller *The Surround II* is arguably the country's best value in a dipole radiator speaker. **\$249<sup>99</sup> pr.**

## Powered Subwoofers

The original *Powered Subwoofer* by Cambridge SoundWorks consists of a heavy-duty 12" woofer housed in an acoustic suspension cabinet with a 140-watt amplifier and a



built-in electronic crossover. *Stereo Review* said it provides "deep powerful bass...31.5 Hz bass output was obtainable at a room-shaking level...they open the way to having a 'killer' system for an affordable price." **\$699<sup>99</sup>**.

Our *Slave Subwoofer* uses the same woofer driver and cabinet, but does not include the amplifier or crossover. It can only be used in conjunction with the *Powered Subwoofer*. **\$299<sup>99</sup>**. The new *Powered Subwoofer II* uses a 120-watt amplifier with an 8" woofer. **\$399<sup>99</sup>**.

## Home Theater Speaker Systems

We have assembled a number of home theater speaker systems that consist of center

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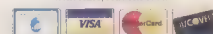
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CIRCLE NO. 29 ON READER SERVICE CARD



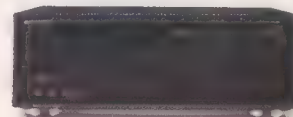


# Worker ants spend their entire lives bringing home sustenance to the queen and her young.

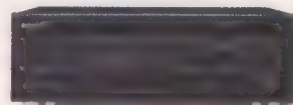
(We apologize if this sounds familiar.)



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## censor-chip

Washington is buzzing about "objectionable" TV programming. Though reform-minded politicians are otherwise trying to limit the reach of big government, many legislators in both the House and Senate want TV makers to build a "v-chip" into their sets. The v-chip (the "v" is for "violence")



would block programming that includes violence, explicit language, and/or sexually explicit scenes.

The v-chip works like this: A TV-industry panel (or, if necessary, a federally appointed panel) would evaluate programs for their content. Broadcasters would have to plant an electronic "flag" in any program that the panel deemed objectionable, and that flag would trigger a TV's built-in v-chip. Parents would then be able to use the TV's remote and a secret code to activate the chip; when activated, it would block all flagged programs.

TV makers have already agreed to build v-chips into *some* TV models, but that didn't satisfy the Senate, which passed a

v-chip measure this summer as part of their telecom bill; it mandates that a v-chip must be built into every TV with a 13-inch or larger screen. The House's telecom bill contains a similar v-chip measure.

President Clinton quickly endorsed the v-chip, saying that it's a helpful aid to busy parents. Senate Majority Leader and Republican presidential candidate Bob Dole calls the chip a dangerous intrusion by government on free speech; he favors a voluntary program, though he hasn't proposed anything specific.

Programmers also oppose the measures, citing both First Amendment principles and the possible impact on ad revenues. TV makers, apparently overlooking their experiences with closed-caption decoders, are



## cam shift

Turning the expected timetable upside down and then tossing it out the window, Panasonic and Sony have announced that they'll introduce the world's first digital camcorders—and the blank digital tapes they use—this October. Once tiresome copyright questions are resolved, digital VCRs will follow.

The camcorders (and VCRs) are termed "prosumer" models, being professional/consumer-grade hybrids. Based on the SD (standard-definition) digital format, Panasonic's PV-DV1000 and two Sony models are said to record and play back digital images with 500 lines of horizontal resolution. If color rendition holds up

asking why all consumers should be forced to pay for something that will only be used in a fraction of U.S. homes.

Supporters see the v-chip as a reasonable alternative to a plan pressed by Senator Ernest Hollings, who's urging a complete ban on violent programs during the hours when children are likely to be watching TV. This notion already has wide support: A Congressional ban on "indecent" broadcasts between 6:00 a.m. and 10 p.m. was recently upheld by a federal appeals court.

—Art Brodsky

## the eyes have it

Canon wants to revolutionize the way videographers focus on their subjects. Their weapon: "Eye Control," the marquee feature on their upcoming ES5000 Hi8 camcorder. It's ingenious technology: The electronic viewfinder in the ES5000 (\$2,300) emits a harmless invisible beam that reflects off of the videographer's cornea. By analyzing the angle of reflection, the cam can precisely determine what the



videographer is looking at and move the cam's autofocus/ autoexposure window to that subject or area, setting focus and exposure on the objects within the window instead of averaging the whole scene. As the videographer's eye moves to focus on other subjects

within the finder, Eye Control tracks that movement and adjusts focus and exposure accordingly. To prevent roving focus/exposure problems, the videographer has to focus on a subject or area for 2 seconds before Eye Control will react. The circuitry, which can be defeated, also lets the videographer control many basic functions—record, pause, zoom, and so on—by focusing on icons in the finder.

—Lance Braithwaite



## THE NUMBER

# 70

**Percentage of adults who categorize "parental channel control" as a beneficial TV feature.**

**SOURCE: USSB Telescoop Survey**

under scrutiny, these images will surpass laserdisc quality.

Digital cassettes, which are less than one-tenth the size of conventional VHS cassettes, will come in 30- and 60-minute lengths and record digital video—using the transform-cosine compression scheme—as

well as PCM audio.

Prices weren't set at presstime, but we anticipate that these first-generation digital cams will start at about \$3,000. Tapes should run between \$10 and \$20 apiece.

Product details are still scant, though Panasonic has revealed that their DV1000 shares many features with their Palmcorder VHS-C cams. An adjustable-speed 10x optical zoom, a 20x digital zoom, and shutter speeds down to 1/8,000 second are all on tap. And an index system marks the first scene shot on any given day for easy access. Other makers expect to have digital cams in stores next spring.

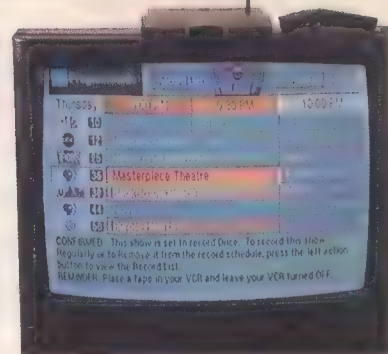
—Marc Horowitz

## guidelines

Following a summer debut in Boston, Chicago, New York, Washington, and several other cities, the VideoGuide on-screen program guide is set to roll out nationally this fall.

Like StarSight, VideoGuide displays a 7-day program grid, but its graphics are snazzier, with more distinctive fonts and colorful network logos. Both guides also feature program synopses as well as one-touch VCR recording.

The VideoGuide decoder is built into a set-top box (\$99) and, unlike StarSight, won't be featured in TVs and VCRs. The two guides are priced similarly,



however; VideoGuide's annual subscription fee is \$50. Unlike StarSight, VideoGuide offers AP and UPI news and sports for a weekly fee of \$0.50 each.

While StarSight's guide is carried on a TV signal's vertical blanking interval (VBI), VideoGuide is carried by BellSouth's national paging service; signals are received by a tiny antenna that's attached to the set-top box. —Marjorie Costello



## dvd watch

The latest news on the digital-videodisc front is that high-level meetings are taking place between the Sony/Philips and Toshiba/Time Warner camps. Though the factions are said to be discussing only the possibility of working together on specific technical aspects of their individual DVD standards (including signal modulation and error correction), the talks are nevertheless fueling hope that a single, unified standard might be agreed upon in time to prevent

a full-scale format war.

● Toshiba/Time Warner has said that their spec includes the Dolby Surround AC-3 digital 5.1-channel surround-sound

format ["Surrounded," September 1995], but they haven't closed the door on Digital Theater Systems (DTS), Dolby's rival. DTS, whose backers include MCA/Universal and Steven Spielberg, did such a good job of impressing Toshiba and Matsushita executives with a summer demonstration that the Toshiba/Time Warner standard might be expanded to include a DTS track. DTS plans to deliver a consumer-grade decoding chip this fall. Sony, whose SDDS digital surround-sound format

competes in movie theaters with commercial versions of Dolby and DTS, hasn't announced which type of digital soundtracks their discs will carry, though the inclusion of AC-3 seems inevitable.

● Sega has announced plans to support the Toshiba/Time Warner standard. This didn't come as much of a surprise, since the Saturn, Sega's new videogame system, is being challenged by Sony's PlayStation ["Battle Stars," September 1995]. ● An NEC division that builds CD-ROM players in the United States is supporting the Sony/Philips standard. This development doesn't cross what has become the traditional line in the sand—consumer electronics companies siding with Toshiba/Time Warner, and computer/

multimedia companies (like NEC's division) siding with Sony/Philips. ● If we needed a reminder of how fast DVD technology is advancing, Hitachi provided it recently when they added a twist of their own to the Toshiba/Time Warner DVD standard. That twist calls for a two-sided disc, with each side having two data layers; total storage capacity is a whopping 18 gigabytes (Toshiba's initial standard provides for "only" 10 GB). Jointly developed with Nippon Columbia (parent company of Denon), this sub-format may prove to be a mere "technology statement," though Hitachi—a charter Toshiba/Time Warner supporter—has pledged to begin selling compatible DVD players and 18-GB DVD software late in 1997. —MH



## star wars

Primestar, the direct broadcast satellite (DBS) concern jointly owned by cable/communications giants Cox, TCI, and Time Warner (among others), is squaring off with the FCC over construction rights on the digital skyway. The trouble revolves around two orbital "parking spaces" that the FCC assigned to Advanced Communication Corporation (ACC) all the way back in 1984.

The story reads like a space opera: ACC's parking spaces remained vacant when their FCC permit expired in 1990. So they filed for, and received, an extension that lasted to August 1994. In 1993, ACC tried to strike a space-leasing deal with C-band stalwart EchoStar, which wanted to



roll out DBS service. But the pair parted ways acrimoniously, with both sides pointing fingers at one another. (EchoStar found spaces elsewhere, and plans to have their DBS service up and running this winter.) So in August 1994, ACC filed for another extension. While waiting to hear back from the FCC, ACC got together with Primestar; in September 1994, 1 month after the extension

deadline had expired, ACC inked a deal with Tempo, another TCI subsidiary, to use the spaces for Primestar birds. The FCC had other ideas, however.

Last April, the FCC refused to extend ACC's permit, deeming it null and void. ACC "had made little progress in the construction, launch, and initiation of a DBS system over the last decade," the FCC's International Bureau

reported, adding that ACC had been "warehousing" the slots, presumably because they wanted to sell them off to the highest bidder. Primestar and ACC immediately filed appeals with the FCC. At the same time, some of the backers of the DSS DBS system asked the FCC to stand by their ruling, claiming that DSS was supposed to be an *alternative* to cable services, and that Primestar's cable-giant roots would result in a monopoly for TCI, Time Warner, *et al.* "[The FCC] is creating a monopoly on high-powered DBS for USSB, DirecTV, RCA, and Sony," fired back Carolyn Neary, Primestar's director of corporate communications. The FCC expects to rule on the appeals soon.

—Chuck Tannert

## spec talk

We've been wondering just how THX's surround-sound spec would go about accommodating Dolby Surround AC-3 digital surround sound ["Surrounded," September 1995], and a recent THX announcement spills some details. Their AC-3 spec retains the re-equalization curve and surround-sound decorrelation familiar from THX's enhancement of Dolby Pro Logic. But the spec's timbre-matching provisions have been expanded to include the full-bandwidth potential of the surround speakers. And THX-enhanced AC-3 adds multichannel bass management, which is said to ensure that low-frequency effects (LFE) information will be properly handled with virtually any

speaker/subwoofer setup. Finally, a time-alignment circuit is designed to help sounds from each speaker arrive at the listening position simultaneously, even when the speakers are located in less-than-ideal positions.

- Next-generation THX-certified AC-3 decoders will incorporate a Motorola DSP56000 processing chip. The first THX-certified AC-3 decoder to reach A/V shops, found in Denon's AVP-8000 preamp/tuner/processor ["New Tech," page 60], uses Zoran's 38500 chip for AC-3 processing and Motorola's 56004 for THX/DPL processing.

- As part of the Theater Alignment Program (TAP) offered by Lucasfilm Ltd., THX's parent company, moviegoers are being

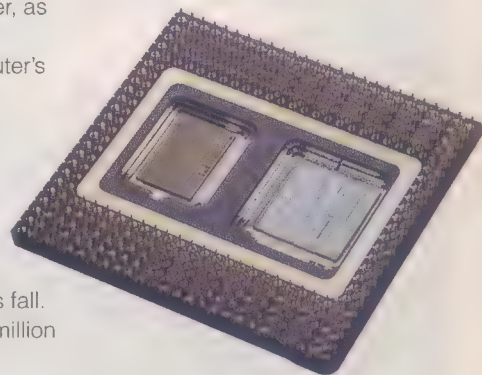
encouraged to call THX if they experience video or audio problems at the theater. To spread the word about the TAP, THX's phone number (800.746.6384) is being included in the end credits of high-profile films, including *Apollo 13*, *Casper*, and *Waterworld*.

—Peter Barry

## speed demon

The fastest chip on the block is getting faster, as the technology that determines a computer's processing speed continues to race unabated: Intel has announced that the next generation of Pentium chips—dubbed P6—is due to be introduced this fall. With more than 5.5 million

transistors (the current incarnation has a mere 3.1 million) and a first-generation operating speed of 133 MHz, the P6 should deliver twice the performance of today's fastest Pentiums at the same clock speed. The P6 is expected to appear initially in PCs retailing for about \$4,000, though that price tag should drop hard and fast within 6 months of its introduction. —MH











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\* Programming sold separately.

CIRCLE NO. 61 ON READER SERVICE CARD



## Sony's digital videodisc is a marvel of real-estate management

# DISC FACTOR

**T**HE EVOLUTION OF TECHNOLOGY IS a lot like the movement of tectonic plates. On the surface, everything seems nice and quiet. But underground, colossal forces are at work, slowly building up pressure. In the case of earthquakes, most everyone knows that these forces are always increasing and that, inevitably, the breaking point will be reached and another earthquake will occur. The one thing no one knows is exactly when it will happen and how large it will be.

Pressures also build with new technology. Everyone knows that "state of the art" is a constantly moving target—that innovations will eventually change *everything*. But no one (marketing hype aside) can say exactly when a truly major innovation will hit. The VCR was one such technology, as was the compact disc. Both radically changed the landscape, and in the years following their introductions we were buffeted by aftershocks. Today, another technology earthquake appears to be imminent. It's called digital videodisc, or DVD, and its inventors are hoping that it'll be *huge*.

DVD endeavors to change video forever by taking us from analog to digital, from tape to optical disc. In short, it's expected to do what the 12-inch analog videodisc does—only more of it, and better. With DVD, an entire feature film with surround audio soundtracks can be placed on one CD-sized disc. The standards allow for picture quality that should easily equal—and surpass—that of laserdisc, and audio quality that

should equal or surpass that of CD. Hardware and media manufacturers, recognizing the importance of time-shifting, are already openly discussing the implementation of recordable DVDs, including write-once and erasable formats.

The specs and technical papers I've read certainly indicate that DVD has what it takes to change everything—and

however, is not to muse on the specter of another format war (the thought of which sends chills up my spine). Instead, we'll take a close look at the technology—MMCD in this column, and SD in an upcoming column.

**MMCD and MPEG-2.** When it was launched, the compact disc was rightly heralded as a data carrier of immense capacity—unless you're talking about

full-motion digital video, that is. The plain truth is that the CD's 650-MB capacity is way too small for that use. If you tried to fit a full-bandwidth video signal on a CD, one disc could hold about 30 seconds of a program, and it'd take an entire hour to play it back—not particularly exciting for a consumer product.

The MMCD, on the other hand, is a marvel of real-estate management. From

its coding of video and audio signals to its error-correction systems and its basic layout for storing data, the MMCD was designed from the ground up to hold *huge* amounts of data. And short-cuts don't appear to be part of the picture.

The MMCD standard uses high-density coding to place 4.5 hours of *studio-quality* digital video and audio (as well as other types of data) on one side of a single disc. To further increase capacity, MMCD shrinks the wavelength of the reading laser and torques up the system optics; this allows the pits in which data is stored to be smaller. As with the music CD, the pits on an MMCD circle the disc's surface, from its inner to its outer circumference, in a spiral.



mainly for the better. But billions of dollars of profit are on the line (after all, we're talking about the heir to the prerecorded videotape), so it's natural for there to be some competitive friction in DVD's development. Sure enough, two rival DVD formats have been proposed, and though they're very similar in nature, there are essential differences.

The MMCD format (for MultiMedia Compact Disc) comes from Sony and Philips, while the SD format (for Super Density) has been presented by Toshiba and Time Warner. Both are scheduled for launch next June, and unless some serious negotiation occurs soon, the seismic shocks these formats produce will go head to head. Our purpose here,



Specifically, MMCD employs a red laser with a wavelength of 635 nanometers and an objective lens with a numerical aperture (NA) of 0.52. This allows a track pitch of 0.84 micrometer ( $\mu\text{m}$ ) and a minimum pit/land length of 0.45  $\mu\text{m}$ . In other words, the tracks are 0.84  $\mu\text{m}$  apart and the pits and "land" (read: pitless) area between them can be as little as 0.45  $\mu\text{m}$  long. Compare that to the music CD, which has a track pitch of 1.6  $\mu\text{m}$  and a minimum pit/land length of 0.833  $\mu\text{m}$ . In short, more pits equals more data capacity.

Other physical specs of the MMCD, such as disc diameter (120 and 80 mm) and thickness (1.2 mm) are unchanged. Because of this, music CDs, CD-ROM discs, and other formats that conform to the CD-Audio standard will be playable in a MMCD player. (The 80-mm disc—similar to the 3.5-inch music "CD single"—probably won't play a significant role in the United States.)

The high-density coding I mentioned is a form of data reduction, and it's responsible for much of MMCD's increase in data capacity. Like DSS, MMCD uses the MPEG-2 standard, an algorithm specifically designed to have the potential to code video and audio with broadcast quality. At the same time, MPEG-2 maintains data rates that accommodate the abilities of a consumer player or recorder.

MPEG-2 is a smart coding method. In many data-reduction schemes, such as MPEG-1, PASC (used by the DCC audio format), and ATRAC (used by the MD audio format), the data rate is constant. This is inefficient because bits are constantly flowing whether or not the current signal really needs all of them; if it doesn't, the "extra" bits are essentially wasted. With MPEG-2, the transfer data rate is variable. A "busy" scene that requires a high rate for accurate coding, such as a football play or high-speed car chase, is handled with a high data rate, while an "easy" scene, such as a talking head or someone puttering about a room, is assigned a lower data rate. Overall, this efficiency results in better use of disc space and, therefore, greater capacity. [For more on MPEG-2 coding, see "Digital Reality," September 1995.]

The MMCD's linear track speed is

variable from 1.2 to 4 ms. At the top speed of 4 ms, data is output at a rate of 11.2 Mbps. This bit rate is capable of enabling truly outstanding picture quality—and the range keeps bits from being wasted.

When it comes to data reduction, encoding a signal—a movie, for example—is more critical than decoding it because encoding involves intensive number-crunching. Encoding, in fact, largely determines the quality of the signal output by the decoder. So Sony and Philips have worked hard on developing their encoders.

The Sony system inputs video at a rate of 165 Mbps, performs a "first-

pass" reduction to achieve an average data rate of 3 Mbps, and then performs a second pass to optimize the data rate within the limits of its operating range. The various scenes presented by the video signal are judged for their "difficulty factor" and an estimated bit rate necessary for high-quality coding is allotted. Though the format's engineers have tinkered with a third pass, which could be used to tweak the encoded signal even more, it's not presently being used in first-generation coders. These coders are in use today, by the way; Sony reports that they've set some up in a Los Angeles studio, and engineers are said to be hard at work crunching

## WEB WATCH

I HAVE SEEN THE FUTURE. I CAN DESCRIBE IT TO YOU: IT'S COLORFUL, IT GLOWS IN THE dark, and it looks like it was built by Salvador Dali. Though it seems to be floating in space, you often hear crickets and other pleasant sounds. You can say hello to a guy in Norway . . . and then go around to look at the back of his head. You can listen in on other people's conversations, you can hover above the ground, and you can be anyone you want to be. No one is really there, but it's getting more and more crowded every day. It's called Worlds Chat. It isn't a product, and it isn't a thing. It's a cyberplace.

Worlds Chat (<http://www.worlds.net>) is the wonderkind of

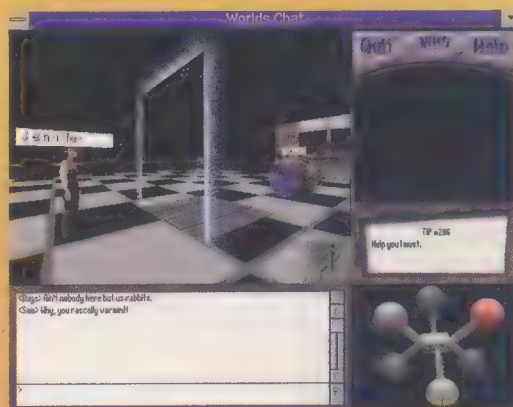
Worlds Incorporated, one of your superior videogame companies. It's a three-dimensional world on the World Wide Web, and it is amazing.

When you enter the World, you'll see a space station with rooms and corridors, staircases, and escalators connecting them. You can teleport from one room to another. You'll find many other cyberpeople there—people just like you and people completely unlike you. They're from all over the world. You can communicate with them by typing in text and reading (and reacting to) their responses. Worlds Incorporated says that real-time audio conversation—via microphones and speakers—is on the way. Maybe real-time video isn't far behind.

Everything is 3-D. You can move up to the "avatar" that represents another cyberperson and then move around it, seeing it from every angle as you go. You can look in all directions and move freely about the World. You can move alone or in a group. You can hang out with your buddies. You can make new buddies.

Getting there isn't simple, though. In addition to at least a 486 processor, Windows 3.1, 8 MB of RAM, 256 colors, and a 16-bit sound card, you need an Internet TCP/IP connection. No, a modem—no matter how "fast"—just won't cut it. But the gyrations it takes to get there are absolutely justified by the experience. Like I said, this is the future. I'll see you there.

—KCP



Back to the future: a sample Worlds Chat screen



the Sony Pictures library of movies for eventual release as MMCDs.

The program's soundtrack is similarly subjected to a two-pass encoding sequence. The average audio bit rate is 384 kbps; this rate is already widely used for digital 5.1-channel audio and is known to provide excellent sound quality, without audible artifacts.

**MMCD Features.** To accommodate a wide variety of audio/video programming, Sony and Philips have developed single- and double-layer MMCDs. The single-layer version contains 3.7 GB of data (that's 5.5 times the data capacity of a music CD) and can hold 135 minutes of studio-quality MPEG-2-encoded programming. The soundtrack can be coded with either two-channel or 5.1-channel surround sound, and it's compatible with Dolby Pro Logic as well as other existing MPEG audio formats.

Video can have an aspect ratio of standard 4:3 or widescreen 16:9. Features include chapter division and access, copy protection, parental lockout, and multiple-speed forward and reverse scan functions with a noise-free picture. In addition, DVD can display extremely high-quality still pictures. MMCD supports the NTSC and PAL television standards, with various line resolutions of up to 720 pixels. The disc has additional capacity for three to five different languages as well as subtitles in four to six different languages.

The dual-layer MMCD was developed by 3M. This disc doubles capacity to 7.4 GB (11 times the data capacity of a music CD) and provides 270 minutes of uninterrupted audio/video playing time. Two separate data layers are formed in a single, solid substrate. A semi-reflective layer allows the reading laser to access both data layers by refocusing the laser's focal-plane servos. Continuous playback—with no appreciable lag—is part of the spec, as the laser reads outward on one layer, then inward on the other. All of the features offered by the single-layer disc carry over to its dual-layer sibling.

**Error Correction.** Coding video and audio signals isn't a walk in the park, though. Since huge amounts of data are involved, the propensity for errors is relatively enormous. And because MMCD will also be used for unforgiving computer applications, the MMCD disc must have the data integrity of a CD-ROM disc. In addition, the

MMCD's data density dictates that the negative effects of any flaws that are coded will be magnified, since they'll affect a larger number of bits. To combat flaws, MMCD uses a variation on the music CD's Cross-Interleave Reed-Solomon Code (CIRC) error-correction system. It's known as CIRC Plus.

Nitty-gritties for gearheads: CIRC Plus adds only 308 parity bytes to assist in the detection of errors, compared to the 784 bytes used in CIRC. CIRC Plus uses two Reed-Solomon codes: (170:162) C1 code and (170:156) C2 code. During decoding, all of the symbols used to represent data are checked by both codes; CIRC Plus performs C1 decoding and then C2 decoding, and then C1 is performed again. The decoder can correct burst errors that are

## Dual-layer MMCDs can hold 11 times more information than a standard music CD.

four times longer, and a random error rate that's 20 times higher, than in a music CD. The bottom line: Less disc real estate is wasted on bits whose sole reason for being is error correction, but error-correction performance is vastly improved through the use of more sophisticated and more thorough techniques.

MMCD also uses an advanced version of the music CD's eight-to-fourteen modulation (EFM) code to reduce errors. It's called EFM Plus. Regular EFM, which uses 14-bit codewords to represent 8-bit words and three companion "merging" bits to link the 14-bit codewords, isn't very efficient. The merging bits, for example, are on hand simply to accommodate the 14-bit codewords. So EFM Plus does away with the wasteful merging bits altogether. Other technical niceties: In EFM Plus, the 8-bit input is converted to a 16-bit output and serialized into EFM Plus frames that consist of 85 data symbols as well as sync words. For each data symbol and state, the conversion table contains an EFM Plus codeword and the value of the run-length for the next data symbol to be encoded. There

is a substitute conversion table in addition to the main conversion table; it contains 88 codewords with opposite-sign digital sum values (DSV) that are used to maintain an approximately zero DSV. The bottom line: As with CIRC Plus, EFM Plus does a better job of limiting errors while using less of the disc's overall data capacity to do it.

**Data Formatting.** The MMCD's data format is similar to—but more efficient than—that of the CD-ROM. User data is organized into sectors. Each sector holds 2,048 bytes of user data as well as a 4-byte sync pattern, a 16-byte header, and 4 bytes of error-detection code. The sector header contains an address, a header, copyright restrictions, the disc layer number (0 or 1), a track number, application code and data, and a cyclic redundancy check code (CRC) that detects errors within the header. MMCD can work smoothly with only 4 sync bytes because additional sector-syncing information (32 channel bits worth) is incorporated in the EFM Plus coding; the CD-ROM uses 12 sync bytes. Thanks to this grand scheme, only 24 bytes in each sector are used for something other than program data. Compare that to the 304 bytes used to similar ends in a CD-ROM.

Data sectors are assembled into tracks. With a single-layer disc, the track starts at the innermost edge of the disc and works its way to the outermost edge of the disc's program area. With dual-layer discs, the track starts at the same point of the surface layer (layer 0), heads to the outer edge of that layer's program area, and then works its way from the outermost edge of the sub-layer (layer 1) to its innermost edge. Each sector has its own address, which increments up as the tracks make their way from edge to edge.

Additional savings in real estate are provided by way of the guard areas that bracket a disc's (or layer's) program area. Information layers in both disc types are comprised of an inner guard area (IGA), the program area, and an outer guard area (OGA). The guard areas are slightly smaller than the lead-in and lead-out areas used in music CDs. As a result, the MMCD's program area begins at 23 mm; the music CD's program area begins at 25 mm.

Yet more space is saved through the MMCD's layout for table of contents

CONTINUED ON PAGE 89



# THE GREAT \$9.95 CD-ROM DEAL



**Mavis Beacon Teaches Typing**  
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WIN 386 4mb M K  
MAC LCII 4mb M



**Beer Hunter**  
Gen. Interest 5040803  
WIN 486 4mb M  
MAC LCIII 4mb M



**Daedalus Encounter**  
Interact. Game 5034707  
WIN 486/33 8mb M K  
MAC LCIII 8mb M



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**CPU** Button indicates the minimum processor required. If a title is available in PC and Macintosh formats, the top half of this button represents PC system requirements and the bottom half represents Macintosh system requirements. Note: Ser.=Series, Class.=Classic, Pent.=Pentium. For Mac - LC series includes LC 475, Performa 475, Quadra, Centris, Powerbook 180C, IIfx or better.

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[80]

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# Ghosts in the Machine

**How to recognize and  
eliminate video distortion**

**BY MARK ELSON**

MAYBE YOU'RE NOT GETTING ENOUGH SLEEP. YOU'VE BEEN NOTICING SOME pretty odd things on your TV screen lately (and I'm not talking about Richard Simmons). Those squiggly traveling lines, that purple blur in the corner, and is that *snow* . . . in the middle of *Lawrence of Arabia*? Your eyes must be playing tricks on you—or are they?

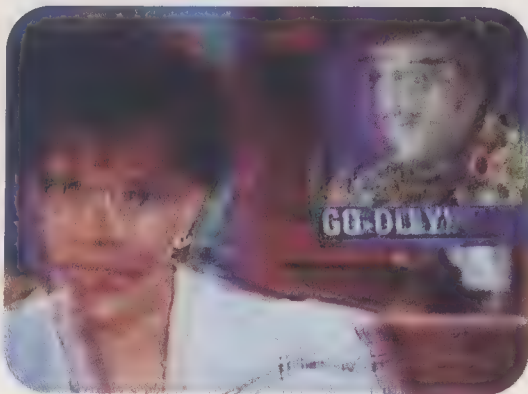
Chances are your eyes are just fine. The problem is probably video distortion, which we'll define as anything that isn't part of the original, ideally pristine signal. Distortion can manifest itself in virtually limitless ways, and it can wreak havoc on your picture at any point in the signal path and from any source—be it a standard broadcast, cable, a satellite dish, a VCR, or a laserdisc player. Other varieties of video distortion are so common that you may passively accept their presence. In any case, you should know that it's easy to eliminate many of them. The reward: You'll be able to enjoy the best performance your video equipment can deliver.

Bear in mind that, when you're trying to isolate specific video problems, it's imperative to start with an unimpeachable source component. In descending order of preference (due to basic signal purity), a signal generator, laserdisc player, S-VHS VCR, and standard VHS VCR are all usable as distortion-hunting sources. If you're using a VCR or laserdisc player, determine its unimpeachability by comparing its performance to that of a reference component. This might involve a service call or a trip to an A/V shop, but it'll be worth it. If you find major performance discrepancies between your component and the reference component, you should address them first; minor discrepancies can be shrugged off, though you should keep their existence in mind as you proceed with your tweaking.

Using your unimpeachable source component, you should adjust your TV for optimum performance with test signals and patterns. The *A Video Standard* laserdisc (\$70; available at many video-rental shops, or call 415.355.1892) and *The Hi-Fi Alignment Tape* or *The VCR Playback*

PHOTO BY TONY CORIO/ZA





Multipath appears as ephemeral images not related to the signal or as multiple or blurred images.



Placing unshielded speakers too close to your TV set can introduce unsightly purple and green blotches.

*Test Tape* (\$60 and \$25, respectively; distributed by MCM Electronics, 800.543.4330) are good options. This step may take several hours, but it's critical to your success.

## CABLES

The first thing you should check is the integrity of your connecting cables; faulty video cables can cause major performance problems, including a grainy picture (AKA "snow"). In descending order of preference, S-Video, RCA, and F-type cables and connectors come into play. You should always use the shortest cables that'll suffice. Heavy-duty (though not necessarily high-priced) cables are recommended. Gold-plated connectors also offer benefits: The signal path will have better conductivity, and you'll eliminate the risk of corroded or deteriorated connections.

When using F connectors, make sure that the connector's stiff inner pin, which is made of copper, isn't nicked, bent, or damaged in any way. Be careful when inserting common "RG6" coaxial connectors into your TV, cable box, VCR, or A/V receiver. Check the

integrity of cables by wiggling the connector and the joint between the connector and its cable while your system is active—if the picture degrades, change the interconnects. Terminal cleaners and conditioning chemicals like those from Tweek, Radio Shack, and others can also help prevent corrosion and preserve good contact between the terminals.

## MULTIPATH

Your typical roof antenna is a common source of video distortion, and multipath is the form it most commonly takes. Multipath is created when the signals broadcast by TV towers reflect off of obstructions in between the towers and your home. Each time the signal strikes an obstruction—a tall building or hill, for example—a duplicate signal is created. Since there are likely to be many obstructions in between the tower

and your home, a huge number of these duplicate signals, or "reflections," will merge at your antenna at roughly the same time. On-screen, you'll see either "ghosts" (non-specific, ephemeral images that are not related to the signal), extra images (objects in the signal repeated at various spots on the screen), or "smear" (a blurred image).

Combating multipath is a multi-step process. You can begin by aiming your antenna directly at the broadcast towers. You have to know where the broadcast towers are in order to do this, of course; a phone call should solve this particular mystery. In most parts of the country, you'll find broadcast antennas located at the locale's highest elevations. In confined metropolitan areas, on the other hand, broadcast towers are propped on top of various buildings. If there's a large permanent obstruction (like another building or a mountain range) between your home and the tower, you may not be able to receive an ideal signal. But you may also luck out and receive a strong reflected signal. When you don't have a direct line of sight, you should experiment with your antenna's orientation.

Antenna setup and connections are critical. Isolate the antenna as much as possible from other antennas or metal objects. Run the cable connecting your antenna and equipment in as direct a line as possible. As always, make sure that the cable itself isn't frayed, and determine that the jacks and connectors aren't corroded, dented, or nicked.

If you use a 300-ohm twin lead, don't run it through PVC or any other conduit. Next, "tune" the lead by gripping it in one hand and pulling it with the other, just as you'd work out the kinks in an AC cord or speaker cable. Then twist it one turn per foot. As I've implied, your antenna lead should be as short as you can make it.

Apartment dwellers whose systems are connected to one master antenna (MATV) face a few unique problems. Each time the signal traveling from the main antenna (or cable lead) passes through a splitter and wall terminal and into each dwelling, the signal's integrity is compromised. In a good MATV system, signal boosters are periodically installed in the signal path as a fix. But even in a good system, misuse by even a single neighbor can deteriorate the community's signal. If someone dents or otherwise harms their wall terminal, for example, neighbors downstream in the signal path may get distortion.

If you're experiencing distortion or certain channels are unwatchable, you may want to determine whether your upstream neighbors are abusing the system. You can simply discuss the subject if you're on friendly terms with them, but if they're strangers (or just strange) you may need to snoop.

## SPLITTER PROBLEMS

Ghosts and smearing may also be the result of a phenomenon known as "echo." A splitter or A/B box that's faulty, damaged, or just poorly installed can allow signals to creep back up the line to the antenna or cable source, which will simply "read" them and feed them back downstream.

When splitters are used—especially cheap ones—the system's signal-to-noise ratio (S/N) drops radically. And signal loss equals picture noise. A simple two-way splitter creates 3.5 dB of signal loss, while a four-way splitter causes 7 dB of loss. If you must use a splitter, get one that has the precise number of terminals you need.

Always use the best, most expensive splitter you can find. Good splitters, at



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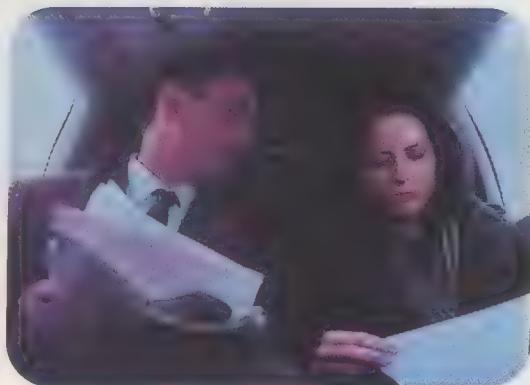
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**"Blooming,"** which is usually manifested as oversaturated reds, can often be tamed by carefully adjusting your TV set's picture controls.

about \$9 or \$10, cost only a few bucks more than cheap ones, but they're a sound investment and a small price to pay for several decibels of S/N. Look for solid construction, a welded or soldered outer core, gold-plated terminals, and complete metal shielding. Avoid snap-on-type F connectors, since they can jeopardize signal integrity.

To install a splitter, carefully insert the male end of the source's F connector cable into the female input terminal of the splitter. Make sure it's securely inserted and then screw the F connector's collar onto the neck of the splitter's terminal. Then use another cable to attach the splitter's output to the TV's input.

If, despite my extremely good advice, you're stuck with a multi-tap splitter and aren't using all of its terminals, cap off each unused one with a 75-ohm terminator; you should be able to find these terminators at your local electronics shop.

### SIGNAL SPLITTING

A good splitter can do a decent job of sending antenna or cable signals to multiple TVs. But if you need to feed one video source like a VCR or laserdisc player to several TVs, an audio/video distribution amp (A/VDA) is a better bet. A/VDAs, which typically measure about 3 x 5 x 4 inches (h/w/d), do a better job than simple splitters because they buffer and amplify the signals passing through them. This combats the signal loss you get whenever you run long signal leads or introduce something—like a splitter—in between source components and a TV (as well as audio gear). You can find good models for \$200 to \$400. Look for an "insertion-loss" specification of less than

-1 dB. This represents the reduction in signal strength the A/VDA introduces, and a loss of less than 1 dB is acceptable.

Connecting your video sources to an A/VDA is just like running them to a splitter: the source's A/V outputs run to the A/VDA's A/V input. The A/VDA's video outputs simply run to your TV(s), and the A/VDA's audio outputs can be run either to audio gear or directly to the TV(s). If you're feeding multiple video sources to

a single TV (and don't have an A/V receiver that can handle this signal-routing job), you'll need to get your hands on a video selector or switcher. Good models start at about \$100 and can run up to about \$600.

### SIGNAL OVERLOAD

If vertical black bars are moving left to right and back again across your screen, your system is suffering from signal overload—that is, a signal level that exceeds your system's real-world input capacities. The "windshield-wiper effect" can also be manifested when a signal appears on more than one channel or when a strong signal dominates a weaker one. If you're receiving too much signal from over-the-air stations, you can fix things by installing an attenuator pad (\$10 to \$20) in the antenna lead. It's a simple wire-it-in procedure, but it's important to add the pad as close to the antenna as you can get it.

You may also experience this problem with a cable-TV hookup. Unfortunately, there's no DIY solution here, and a service call is the only remedy.

### TRAVELING DIAGONAL LINES

With some cable systems, *diagonal* lines can travel across your TV screen. You may only notice them when you replace an old, say, 19-inch TV with a bigger set, since larger sets don't always "hide" distortion as well as smaller sets can. The fix: A new TV or VCR usually comes with a variety of accessories. These may include a 75 to 300-ohm transformer (a small, tubelike device sprouting short antenna leads) and a 300 to 75-ohm transformer (a small black-plastic cube with two screws mounted on it). Attach them to each

other by securing each of the former's 2-inch "C-clips" underneath the latter's small Phillips-head screws. Congratulations—you've just built an isolation ground transformer! Now plug your cable lead into one end of the IGT and plug it into your TV's CATV input. Those traveling diagonal lines should disappear.

### DISCOLORATION

No one likes it when unsightly color blotches make their way onto your screen. This can happen when "unshielded" speakers are set up close to a direct-view or rear-projection TV for home-theater purposes. The short form: Virtually every speaker driver employs a magnet, and magnets create a magnetic field that, if left unshielded, emanates beyond the speaker's cabinet. Purple and green discoloration results when that field interacts with a TV set's internal circuitry. The fix is either to move the speakers further from the TV or to replace them with shielded models; the latter fix may be preferable, since moving speakers too far from the TV may disrupt their attempts at creating sonic images that match the visual images you see on-screen.

If either fix doesn't cause the discoloration to disappear, you should try "degaussing" the screen. Plug a degaussing ring (about \$30) into a wall outlet or power strip and move it slowly over the TV screen and the sides of the cabinet in small, smooth circles. When you've completed this process, move the ring away from the screen in a slow, smooth circular pattern. When the ring is approximately 3 feet away from the TV, you can shut it off and unplug it. (Warning: Don't wear a wristwatch while degaussing. The strong magnetic field could damage it.) If the degausser doesn't fully eliminate the discoloration, your set will need professional attention.

Note that blotches can also appear on projector screens. They're a function of projector and/or screen quality and can't be tweaked away. The only remedy is to buy a new projector or screen.

### BLOOMING & EDGINESS

If you're a regular VIDEO reader, you know that, in the early 1950s, the FCC established standards for color TV. These NTSC (National Television Systems Committee) standards cover all aspects of video performance: gray scale, black-level (brightness), white-



level (contrast), and color temperature. Since the standards apply to media as well as hardware, a TV that adheres to these standards should produce excellent pictures when any program that meets them is viewed in the proper environment. And if every TV set adhered to these standards, their pictures would all look identical, for the most part. That isn't the case, of course.

In the real world, TV manufacturers have to compete against one another, typically on the crowded, brightly lit floor of a big electronics outlet. It's a truism that the set whose picture *jumps* out at the prospective buyer usually is the one that gets purchased. To make their pictures jump in this environment, many manufacturers purposefully crank up their sets' picture controls at the factory, adjusting them well away from the NTSC standard. This type of color rendition may seem normal if you've never seen a picture that does adhere to the NTSC standards, but it isn't lifelike, and it can fatigue your eyes. It can also wear down the tube's (or tubes') phosphors prematurely, and it can stress a set's internal video amplifiers and other circuitry as well—imagine running your car at 7,000 rpm all the time and you'll get the picture.

There are two steps in bringing any given TV in line with, or close to, the NTSC standards. The first is the proper adjustment of the set's basic picture controls (COLOR, CONTRAST, SHARPNESS, and so on), and this is something that you can do yourself as long as you have the right test material. The *A Video Standard* laserdisc and *The Hi-Fi Alignment Tape* videotape mentioned earlier provide all of the test patterns you need as well as instructions that clearly delineate the process.

The second step is a professional calibration of the set's various internal controls. This isn't a DIY project; you need to contact a qualified technician, who'll charge you between \$150 and \$350 to do the deed (this includes proper adjustment of the external picture controls). While adjusting the picture controls is advisable under any condition, note that a set that's calibrated to the NTSC standard will look truly excellent—but only when it's viewed in an ideal environment and with top-quality source material. Room lighting plays a critical role here [see "Citizen Kane," June 1995], and a calibrated TV will reveal the flaws in less-than-ideal programming, often to painful ex-

tremes; you'll probably be able to see every flaw in an average antenna or cable-TV feed or in a typical rented videotape, for example. In other words, a calibrated TV should look breathtaking in a dedicated home theater or "media room" that's spinning top-notch laserdiscs or S-VHS tapes—but it may not look so hot in an average living room. The ability to switch from calibrated settings to "conventional" settings that make the picture look great in a brightly lit room is the real-world ideal.

### RADIO WAVES

You may see oscillating lines or curved patterns on-screen if a strong local FM radio station is interfering with your TV signal. Since strong local FM stations or other "stray" RF signals can leak into your system at any weak point (a bad connection, frayed cable, defective antenna, and so on), this type of distortion may surface at any time. It's actually a harmonic of the radio station's broadcast frequency. The cure: Solder an "FM filter trap" across the antenna terminals of the TV. You need to know the specific radio-frequency harmonic that you want to trap, however, so call the engineering department of the offending station; you can generally identify it because you can also hear it through your TV's speaker(s).

### LOW VOLTAGE

Another truly unsightly form of distortion results in a picture whose sides are pulled in toward the center of the screen. "Picture pull-in" is caused by low AC line voltage, and it's especially problematic in rural areas. The correct voltage should be 120 volts. Cure: Don't let your TV share AC power with other devices (VCRs, cable boxes, A/V receivers, and so on). In other words, plug the TV into its own AC outlet, without extension plugs or power strips. Ideally, a completely dedicated line should be used—if one is available.

### ARCING

Picture arcing takes the form of small white and dark lines that streak horizontally across the picture. It's caused



"Snow" can usually be banished with logical, step-by-step antenna-and-cable troubleshooting.

when noise is picked up through the antenna system; the noise originates in auto ignitions, neon signs, power lines, motors, fluorescent lights, or light dimmers. Whether you have a roof-type or set-top antenna or are on cable, a chronic arcing problem demands that you replace your current run of antenna lead with a shielded type. Shielded cable comes in both 300-ohm-flat and RG coax varieties.

Arcing can also assault three-tube projection televisions, both rear and front, manifesting as an audible "zap" or "pop" sound. The distortion (not the sound) may be severe enough to destroy sensitive internal circuitry and even the projection tubes. This high-voltage variety of arcing can have several sources. Tubes and high-voltage circuit boards generate static electricity, and most consumer-grade projectors that use them aren't completely protected from it. Unfortunately, there's not much that you can do about it.

Front projectors may attract dust, which can settle on the exposed parts of a tube's neck, the high-voltage circuit boards, and/or transformers. The result: short circuits (that's what causes the zapping or popping sound). The cure: Periodically remove the projector's cover and clean out the set with a compressed-air blower (you can buy one at a photo shop for about \$6).

Arcing may also be caused by an irregular power source. Projection TVs that are used in locales routinely beset by lightning storms or in urban areas prone to brown-outs are particularly susceptible. The cure: Purchase both a good surge protector (\$30 to \$80) and a quality voltage regulator (\$200 to \$300). That's a small investment, really, to protect a multi-thousand-dollar component. ■



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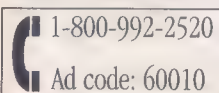


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# SURROUNDED

## Intro to AC-3, Part II: Do you need full-range speakers for the surround channels?

**T**HE ROLLOUT OF DOLBY SURROUND AC-3 clearly is momentous news for home-theater lovers. As our evaluations revealed ["Surrounded," September 1995], this new digital 5.1-channel surround-sound format is powerful stuff: To put it simply, AC-3 makes movie soundtracks sound better than Dolby Surround encoding and Dolby Pro Logic decoding can.

As a new technology, of course, AC-3 adds some twists to home theater's status quo. If you currently have a full DPL home theater, you still need to add—at least—an AC-3-ready LD player, an AC-3 demodulator/decoder,

and AC-3-encoded laserdiscs to enjoy the benefits of AC-3. The biggest question, therefore, may be *How I am going to afford any of this?* Unfortunately, we can't help you with that one. But there are several other hardware-related questions we intend to tackle. First among them: Do AC-3's full-bandwidth surround channels need to be served by full-bandwidth speakers?

The most obvious differences between AC-3 and Dolby Surround are in the rear. First, where the latter depends upon a single surround channel reproduced by two speakers, AC-3 employs two entirely discrete channels—you

can have a sound emanating from the left surround speaker while its opposite number remains dead silent, something Dolby Surround simply can't accomplish. Second, because of the limitations of the matrixing scheme employed by Dolby Surround, its surround-channel response is limited to 100 to 7,000 Hz—which translates into roughly AM-radio bandwidth. AC-3's discrete surround channels, by contrast, are full-dynamics and full-band, from below 20 Hz to 20,000 Hz. Performance-wise, in fact, there's simply no difference whatsoever between AC-3's front and rear channels.

PHOTO BY TONY CORDOZA

**BY DANIEL KUMIN**



Yes, AC-3 changes the home-theater rules. Where conventional wisdom judges that small, bookshelf-type speakers are ideal for surround-channel duties in Dolby Pro Logic systems, an AC-3 setup appears to need larger, full-range surround speakers—presumably big-time floor-standing designs. Few real-world rooms can accommodate a pair of big floor-standing speakers in the rear, however.

Dolby's specification for AC-3 helps out here. It mandates that all AC-3 decoders enable users to direct bass information from none, some, or all of the channels to the "low-frequency effects" (LFE) subwoofer channel. So the surround channels can be digitally crossed over, adding their deep-bass content to that of the LFE channel. In effect, this lets you use a smaller, limited-range satellite speaker to get much of the performance of a larger, full-range speaker.

With this arrangement, of course, the surround-channel bass will emanate from the subwoofer, which may not be set up near the surround speakers. This shouldn't matter (at least in theory), since low bass is generally perceived as omnidirectional. But what if an AC-3-encoded soundtrack includes bass information that's meant to be perceived as emanating from the vicinity of the surround speakers? And what will a sub (or two) positioned in the front of a room do if a soundtrack calls upon it to kick out bass sounds front *and* rear? The patently curious may also be wondering whether this remedy introduces any general sonic compromises. In other words, will bookshelf-type models that are crossed over to a capable LFE subwoofer be outperformed by full-range AC-3 surrounds?

To air out this apparent dilemma, I set up a comparison. The core system was the same one I used for my "Surrounded" AC-3 overview: Enlightened Audio Designs' top-shelf TheaterMaster digital preamp/AC-3 decoder and T-8000 Series III LD/combi-player transport, Acurus and Adcom power amps, and an all-B&W speaker array (Matrix 803-II's left and right both front and rear, a Matrix HTM center, and a Model 800ASW 12-inch powered subwoofer). For this phase, I compared the rear pair of full-range 803-II's to a pair of Matrix 805 bookshelf speakers linked with the 800ASW sub. The rear 803-II's were placed about 8 feet to either side of the primary listening position and aimed in a very broad v rear-

ward. I balanced the 805s on top of the 803-II's and aimed them identically; the sub remained in its front-corner location.

I used the 805s (rather than other B&W dipole and monopole surrounds I had on hand) because each one is functionally the top third of an 803-II; this virtually removed potential timbral differences from the equation. Each relatively compact two-way 805 employs a 6.5-inch woofer and 1-inch dome tweeter. Their response is spec'd at 60–20,000 Hz  $\pm 2$  dB; add the 800ASW subwoofer and response extends down to 17 Hz  $\pm 3$  dB. The 803-II's are rated

## **A single sub may not be enough to fully handle AC-3's very active discrete surround channels.**

to go down to 25 Hz  $\pm 2$  dB. I ran the surround 803-II's full-range (that is, neither crossed over nor rolled off), while the surround 805s were both crossed over to the 800ASW sub and rolled off at 80 Hz, the *de facto* home-theater-standard crossover point. The results are illuminating—if not crystal clear.

With some sequences on the three AC-3-encoded LDs I had on hand (*Clear and Present Danger*, *Stargate*, and *True Lies*), any low bass that might've appeared in the surround channels was "pre-crossed over" (by the movie's mix-down team) to the sub channel. In these cases, there was very little or no deep bass at all in the surround channels. The "Dolby Digital" logo found at the beginning of all three AC-3 discs (which takes the form of a computer-generated locomotive starting up) is a good example: There's lots of deep bass, but below about 60 Hz most of it's mixed to the main, center, and subwoofer channels. In this case, I heard no difference at all between the 803-II and 805-plus-sub setups.

With some scenes that did have a measure of deep bass in the surround channels, I noticed no audible differences when I switched between the 803-II and 805/sub setups. In the *Stargate* segment in which James Spader's "character" is dragged by the camel-ox (or whatever you'd call that big

drooly thing; Side 1, Chapter 6, 40'10"), for example, several distinct low-end thumps are encoded in the surround channels (they're also doubled, to some extent, in the LFE channel). Here, the 803-II/805-plus-sub switch made no audible change in surround effect or spatial content. The two modes did exhibit a slightly different level of low bass, but this is the sort of thing that would be compensated for at the system-balancing stage.

There were, however, several scenes where I perceived a definite change. (And I make these observations despite the well known "fact" that deep bass is not localizable; maybe the fact that low-frequency sounds were emanating laterally, from the nearby surround speakers, made a difference.) The "through-the-stargate" sequence in *Stargate* (Side 1, Chapter 5, 30'56") is a good example: There's lots of mid- and deeper-bass content in AC-3's discrete surround channels here, and switching between the 803-II and 805/sub setups presented a decided change. The difference was subtle, but in the end I actually felt that the 805s-plus-sub were somehow more solid, more defined, and gutsier—just the opposite of what I expected. The vagaries of subwoofer balance, room acoustics, and the effects of speaker placement should be taken into account, of course.

Other scenes presented spatial—rather than quantitative—differences. One of *Stargate*'s "transporter-ring" sequences (Side 2, Chapter 4, 23'07") demonstrated this admirably. In this scene, the AC-3 surround channels carry ominously powerful rumbles that are meant to jump from one rear speaker to the other, and the overall effect was decidedly more centered, flatter, and less involving with the 805s-plus-sub. The 803-II's, on the other hand, gave a breadth and resonance to this scene. The difference was subtle, but it existed. The helicopter-landing segment in *C&PD* (Side 1, Chapter 7, 32'36") prompted similar results: The copters' engine noise and rotor-beat were simply more natural—both fuller and more body-vibrating—with the 803-II's. The difference was even more subtle here, however; high-level listening with the 805s-plus-sub nearly obliterated it.

OBVIOUSLY, WE HAVEN'T GONE FAR ON AC-3's technology curve. Though speaker design isn't likely to change because of it, soundtrack design will as



movie-sound mixers grow accustomed to working with it. The laser-discs I used are among the earliest examples of mass-market AC-3-encoded software, and, as impressive as they are, they clearly don't represent the pinnacle of AC-3 surround sound. Still, *StarGate's* transporter-ring sequence shows that AC-3 is a bottomless bag of tricks.

If at this moment you happen to be gazing thoughtfully at your home theater, plotting upgrade paths for AC-3, one thing is certain: You need at least one subwoofer in your system if you want to take full advantage of the format. As I discovered, you shouldn't feel *compelled* to run out and buy \$3,000-a-pair full-range tower speakers for the rear of your room, since the combination of high-quality "satellite" surrounds crossed over to at least one compatible subwoofer should do a superlative job with any AC-3 soundtrack. Though I often preferred the effect produced by full-range surrounds, it wasn't dramatic enough to warrant "must-have" status.

A single subwoofer may not be enough to fully handle AC-3's very active discrete channels, however. Nor may adding one surround-channel subwoofer in the rear of the room: Though it certainly would deliver most of the benefits of two full-range surrounds (it should help with distinct front-versus-rear low-bass effects, for example), it won't cover the type of side-to-side rear bass effects I heard in *StarGate's* transporter-ring sequences. A truly gonzo AC-3-equipped home theater, in fact, could include (if full-range towers aren't used) five or even six subwoofers: one for each main and surround satellite plus one each for the center speaker and LFE channel.

Dolby, the creator of AC-3 (as well as Pro Logic), states that AC-3 is fully backward-compatible with Dolby Pro Logic systems, meaning that you shouldn't feel pressured into upgrading *any* of the speakers in an existing DPL-based home theater to derive AC-3's full effect. In light of what we've learned, that seems a bit unrealistic. I suspect that AC-3 will beget gradual upgrading all around, much as the compact disc did with two-channel stereo systems. In a perfect world, one in which living space and bank balances weren't inescapable factors, that would probably include full-range speakers in the rear of the room. ■

## BREAKDOWN

### The Subwoofer/Satellite Option

THE EXCITING FULL-RANGE CAPABILITIES of AC-3's discrete digital surround channels pose an interesting challenge to home-theater enthusiasts with a taste for the cutting edge. Clearly, an ideal system would use full-range surround speakers. But deploying them could raise quality-of-life issues: A one-piece full-range tower is a large entity, and may not cut it in a real-world living room. Enter the "subwoofer/satellite" option.

If you're unfamiliar with the "sub/sat" concept, know that it breaks a single full-range speaker into two parts—a largish bass-producing subwoofer (either passive or powered) and a smallish mid/high-producing satellite. The satellite can be anything from a largish bookshelf speaker to a diminutive "mini-monitor," since the subwoofer houses the largish woofer that's required to reproduce the lowest frequencies in the audible spectrum.

In an AC-3-equipped home theater, two smallish rear satellites can be hung on the room's side or rear walls, placed on bookshelves or other furnishings, or be built into the walls or ceiling. As accompaniment, one or two rear subs can be hidden in rear corners or placed to the sides or the rear of a couch; an experienced custom installer can even build the subs into the wall or floor.

Sub/sat systems aren't new to the world of consumer electronics. The first, three-piece incarnation (one sub plus two sats) appeared in 1960, though it was short-lived. In the '70s and early '80s, enterprising audiophiles resurrected the species, mating whatever subwoofer they could lay their hands on with a pair of high-quality studio monitors. Packaged sub/sat systems finally hit the mainstream in 1987, when Bose introduced its line of three-piece Acoustimass systems. In each case, these systems stood in for a pair of conventional stereo speakers; the idea was that you could hide the sub away, and only the smallish sats were left to consume living-room real estate.

More recently, the advent of Dolby Pro Logic-based home theater and its multiple channels has spurred interest in sub/sat pairings and their space-saving ways. One performance-related wrinkle: Many audio/video enthusiasts mate

five identical satellites, for timbre-matched main-, center-, and surround-channel performance, with one or two subwoofers running in stereo or in summed mono.

As we've indicated, sub/sat pairings can make even more sense in an AC-3 system. You can use AC-3's low-frequency-effects (LFE) channel—and a big sub—to handle the lowest octave or two. In such a system, one or two



DCM CX-007 (left), Sub-712

rear subs might only need to go down to about 35 or 40 Hz. Relatively small and affordable subs—such as Cambridge SoundWorks' Powered Subwoofer (\$699), DCM's Sub-712 (\$599), M&K's V-125 (\$695), and Velodyne's VA-810X (\$599)—can do that with ease.

You'll have a cosmetic match if you use a sub/sat pairing for each channel. And, more important, you'll also have a sonic match, as you can expect the speakers to share the same timbre and frequency range. Last but not least, it's usually more cost effective to buy a sub/sat package than to purchase the same speakers separately.

Most speaker manufacturers—including heavyweights such as Bose, Boston Acoustics, Cambridge SoundWorks, Definitive Technology, JBL, and Polk—offer sub/sat systems these days. But keep in mind that many manufacturers who don't sell actual sub/sat packages do offer subs and sats separately. If you already have high-performance satellite surrounds, your least expensive path to topnotch AC-3 will be to simply add a compatible subwoofer or two.

—Rob Sabin



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# WIDE SCENE

## A Brief History of Widescreen Processes BY MEL NEUHAUS

IF A PICTURE IS WORTH A THOUSAND WORDS, A PROPERLY EXECUTED widescreen picture is worth a million. From 1927's *Napoleon* to 1959's *North by Northwest* and 1991's *Terminator 2: Judgment Day*, widescreen presentations have played a major role in the history of the movies. No one who has experienced such an epic in its full theatrical glory can deny the power of widescreen cinematography. And at no time was

this more obvious than during widescreen's heyday—the 1950s, when studios, in their attempt to dazzle moviegoers with a big and bigger experience, rolled out a steady stream of new lenses and formats.

Widescreen formats weren't invented in the '50s, though, as film historians surely know. Filmmakers have sought new ways to create images ever since the first days of motion pictures. By 1920, the movies had already dabbled in such "trifles" as sound, 3-D images, color, and the big screen. At first, each and every one of these developments was virtually held in check; critics—and, in all likelihood, the studios' bean counters—considered them novelty items. As time passed, however, studios and directors pushed the film-technology envelope. Most were motivated by their instinct for survival: The "threat" posed by new electronic media—first radio and then television—clearly sparked the first big-screen films of the late '20s and, later, the widescreen frenzy of the '50s.

While there were exceptions, filmmakers of each era embraced widescreen with open arms. Compared with the 1.33:1 aspect ratio of the existing formats (which is still in use today with conventional TV screens), widescreen movies opened a virtual world of creative possibilities: Sweeping horizons could be presented. Bullets or verbal barbs could



Open wide (clockwise from left): Cary Grant in *North by Northwest*, Arnold Schwarzenegger in *Terminator 2: Judgment Day*, on the trail in *Silverado*, Kirk Douglas in *Spartacus*.





speed from one side of the screen to the other. And “two-shots,” in which a pair of actors standing face-to-face were captured in a single frame (as opposed to traditional, “over-the-shoulder” framing), heightened drama and let passions soar. At the same time, the use of new processes and larger film negatives resulted in richer color and sharper detail, enabling directors to imbue their work with a magical aura that fully captivated audiences. Movies were finally living up to their full potential.

## IN THE BEGINNING

Except for some relatively insignificant tinkering, it all began in the early '20s, when unsung hero Lorenzo del Riccio developed MagnaScope, essentially the first big-screen format embraced by the studios. Until that time, movie audiences viewed 35MM prints projected through conventional lenses onto a 1.33:1 screen. The addition of the MagnaScope lens (viewed as a major deterrent to the then-new home-entertainment medium of radio) retained a similar aspect ratio, but blew the image up to more dramatic proportions.

MagnaScope was used to highlight climactic sequences in big epics like *The Big Parade* (1925) and *Wings* (1927). The system proved to be shortlived, however, as it gave way to del Riccio's next invention, MagnaFilm. MagnaScope was resurrected in the '50s, for the finales of films like *Million Dollar Mermaid* (1952) and *Niagara* (1952). That decade found studios grasping for anything new and different to draw audiences, so these movies were projected in standard 35MM—until their final sequences, when the curtain was dramatically drawn back and the picture expanded like a blooming flower. But MagnaScope's resurrection was brief; this time, the official arrival of Cinerama and CinemaScope chased it out of town.

The work del Riccio did with MagnaScope led him to the next natural step: an oversized film negative. Dubbed MagnaFilm, this 56MM stock was quickly grabbed up by Paramount. A key point is that del Riccio designed MagnaFilm's aspect ratio at approximately 1.85:1, which he arrived at by observing great works of art in various museums. Through all that would come after it, the 1.85:1 aspect ratio would live on, and is known today as the “Golden Ratio.”

At around the same time del Riccio came out with MagnaFilm, Fox was busy developing Grandeur, a 70MM film for-

mat that they used in a small number of productions—the most important being Raoul Walsh's *The Big Trail* (1930). Walsh's picture was shot in two versions: one in standard 35MM, the other in Grandeur. Aside from the obvious attraction of the larger negative, Grandeur excelled because its new Movietone sound-on-film optical tracks were enlarged along with the picture, resulting in superior audio. Grandeur was joined by similar large-gauge processes, including MGM's 70MM Realife (used for 1930's *Billy the Kid*) and others (Warners used 65MM for 1930's *Kismet*, while that year's *The Bat Whispers* was produced in both 65MM and 35MM).

While critically acclaimed, these large-negative formats failed to gain a foothold—theater owners who had drained their coffers converting their theaters for “talkies” had nothing left to spend on big screens and special projectors. And once The Great Depression hit, it slammed the brakes on the industry's initial flirtation with the big screen. Most of the newly developed equipment would lay in hibernation for more than 20 years.

And then there was Abel Gance's *Napoleon*. In 1927, 3 years before oversized negatives first made waves, Gance's 4-hour-plus epic became one of the most significant events in big-screen history. The finale of this masterpiece was presented as a triptych, with three sync'd projectors and three joined screens showing three concurrent images that eventually merged into one sprawling canvas of battle. Though its impact was undeniable, the triptych approach was both costly and unwieldy, and, like the pioneering large-stock formats mentioned above, it sunk into oblivion . . . until it returned in the guise of Cinerama.

## GUILTY AS CINERAMA

If they'd resided in a vacuum, the studios might have been happy to leave well enough alone. Conventional film stocks and cameras were easy and relatively inexpensive to use, and they didn't stress the studios' partners, the theater owners. Even outside the vacuum, events on the world stage conspired to strangle film-industry advances. The Great Depression was followed by World War II; first, resources were unavailable, then they were all devoted to the war effort.

When the war ended, however, it was like someone had opened a floodgate. Television, whose maturation had been





stifled when war broke out, suddenly became a practical reality—and, to the movie industry's distress, a fixture in an ever increasing number of American living rooms. Suddenly, TV was new and exciting—and relatively affordable. The movie industry had to act. The widescreen boom began.

Cinerama was one of the first—and most important—efforts. First developed as Vitarama by Fred Waller, a former special-effects man for Paramount and an expert in wide-angle lenses, Cinerama was a synchronous process utilizing a three-lens camera that captured three separate 35MM images. When projected onto a deeply curved screen that had a slatted surface, the images combined to create an immense panorama: The field of view was some 146 degrees wide and 55 degrees high—that's roughly 2.65:1, which comes close to the peripheral capabilities of the human eye.

After a few exhibitions with demonstration shorts, the public got its first taste of a full feature in 1952, with the privately produced *This Is Cinerama* travelogue. Throughout the decade, other Cinerama travelogues helped the standard gain a foothold in specially equipped theaters across the country and in Europe. Cinerama literally cast a spell on audiences, dazzling and enveloping them—and it spearheaded the widescreen boom that would rage on through the following decade.

The big studios originally rejected Waller's process, however, since its three-projector approach was unwieldy and expensive. MGM eventually came



around, though, and by the end of the '50s a deal was struck to make full-length narrative pictures in Cinerama. 1962 saw the first two MGM releases: *The Wonderful World of the Brothers Grimm* and *How the West Was Won*. In a theater, nothing before or since could compare to the thrill of the triple-projected buffalo stampede or train wreck in *West*, or the out-of-control carriage ride in *Grimm*.

Many theaters weren't equipped to handle Cinerama films, of course, so these films had to be converted for widespread exhibition. Cinerama and MGM optically stitched the three panels together to create a single frame, in a process later known as Super Cinerama. Though the seams are evident in the 2.35:1 letterboxed laserdiscs of *Grimm* and *West*, and some picture information at the extreme left and right edges is lost, Super Cinerama is still impressive enough to give 1990s viewers a taste of what Cinerama—the ultimate big-screen adventure—was all about.

After the successes of *Grim* and *West*, other titles quickly followed. *It's A Mad, Mad, Mad, Mad World* (1963), *Circus World* (1964), *Battle of the Bulge* (1965), *The Hallelujah Trail* (1965), *Grand Prix* (1966), *Khartoum* (1966), *Ice Station Zebra* (1968), and *2001: A Space Odyssey* (1968) were all Cinerama productions—but there was one crucial change. Instead of using triple-lens cameras to shoot these films

(and then having to convert them for presentation in the wide majority of theaters), United Artists debuted a single-lens Cinerama with *Mad, Mad World*. Essentially, this format projected a 70MM print through one wide-angle Cinerama lens. (Similar systems using the 70MM-print/Cinerama-lens approach appeared as Ultra Panavision 70, Super Technirama 70, and Super Panavision 70.) Though the resulting picture lacked the excitement and immediacy of a true Cinerama triptych, it still had spectacular widescreen impact. But the magnificent Cinerama envisioned by its creator was gone.

## UP, CINEMASCOPE

As Cinerama made its mark in specially equipped theaters during the '50s, the Hollywood studios rolled out a variety of more practical if less elaborate (and less effective) widescreen formats. Most significant was CinemaScope, as dubbed by 20th Century Fox, which optioned and copyrighted it in the early '50s.

As the first "anamorphic" process employed by the studios, CinemaScope's contribution to the history of film was enormous. In an anamorphic process, a special camera lens is used to horizontally squeeze the images that are being filmed; this enabled directors to get a widescreen image onto standard non-widescreen film. When this squeezed film is played on a projector equipped with a compatible correcting lens, the entire image—restored to perfect, unsqueezed proportions—appears on-screen in all its widescreen glory. (When it's played on a conventional projector, however, everything looks tall and skinny, as if distorted by a fun-house mirror.)

Unlike some anamorphic processes, in which some squeezing was done during filming and some in the lab, CinemaScope did all of its squeezing at the time of shooting, and its frames contain about twice the horizontal information that can fit in a conventional 35MM frame. This translated to 2.66:1 (or to 2.55:1 when a portion of the film was devoted to a four-track magnetic stereo soundtrack). By the mid-'50s, CinemaScope's aspect ratio was altered to 2.35:1, which is the same ratio, more or less, that's used today.

Fox's first CinemaScope production,



*The Robe* (1953), was a sensation. And though some directors didn't know what to do with the extra image area, many became masters of the new rectangular composition. Otto Preminger's *River of No Return* (1954) and Vincente Minnelli's *Gigi* (1958) and *Some Came Running* (1959) revelled in the glorious freedom of endless vistas; the director's cameras gleefully careened across the soundstages. Nicholas Ray was surprisingly at ease with the process in the epic *55 Days at Peking* (1962), and he clearly enjoyed exploring the intimacy inherent in pensive, no-holds-barred closeups and two-shots, as he proved in *Rebel Without a Cause* (1955). Meanwhile, Frank Tashlin lampooned the widescreen craze with uninhibited comic-book zany in *The Girl Can't Help It* (1956), and Anthony Mann brought new majesty to Westerns and to the spectacle using widescreen imagery, as in *Fall of the Roman Empire* (1964).

Other directors were of a different mind. Billy Wilder, who worked with widescreen formats in *The Apartment* (1960), *Kiss Me, Stupid* (1964), and *The Fortune Cookie* (1966), commented that he loved black-and-white 'Scope because it was "so ugly." George Stevens and Howard Hawks each expressed disdain for 'Scope, however; though the famed snub about 'Scope—that it's "only good for snakes and funerals"—has been attributed to Stevens, it's more befitting of Hawks, as his monumental (though wonderful) CinemaScope flop, *Land of the Pharaohs* (1955), contained an abundance of both.

Noted cinematographers, like Joseph MacDonald and Leon Shamroy, weren't very impressed with the format either. They frequently criticized the process, pointing out (rightly) that the images it created were often marred by distortion and grain (possibly due to the use of imperfect lenses). But by the '60s, a 'Scope process called Panavision had hit the mainstream. Though there's little difference between Panavision and CinemaScope, Panavision is generally accepted as the superior format because it never experienced the early problems with distortion and grain that plagued its forebear.

Panavision is also notable for a bout of improper labeling that has lasted 15 years: Many true 2.35:1 Panavision productions haven't used the logo at all (1981's *S.O.B.* is an example), while



Ads in the U.S. and abroad—for *The Trouble With Harry* (1955), *Vera Cruz* (1954), *Land of the Pharaohs* (1955), *The Good, The Bad, and The Ugly* (1966), and *How to Marry a Millionaire* (1953)—routinely touted their respective widescreen processes.

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scads of 1.85:1 pictures herald either a "Panavision" or "Filmed With Panavision Equipment" logo. Even TV's *Seinfeld* employs the end credit, "Filmed in Panavision," though it certainly can't be—at least by traditional definition. The logical explanation: These productions probably utilized gear Panavision built for standard theater use.

Around the same time that CinemaScope emerged, Mike Todd, the great showman who'd orchestrated much of New York City's famous 1939 World's Fair, began shopping around for a new movie process that would stand apart from everything else available. He ended up dusting off and modifying the original MagnaScope equipment of the '20s and combined it with a 70MM stock to create a process he called Todd-AO. *Oklahoma!* (1955), which was recently released on a spectacular LD drawn from the original Todd-AO elements [see "Tapes & Discs," May 1995], was an early Todd-AO masterpiece.

The AO process delivered a stupendous picture, though Todd, as always, took things to the extreme: He was so adamant that the public see AO exhibitions as a major event that he forbade the sale of popcorn during road-show screenings, so viewers wouldn't associate the experience with an ordinary movie; instead, fine chocolates and other amenities were offered as snacks. AO extravaganzas include *Around the World in Eighty Days* (1956) and *South Pacific* (1958). The format was replaced in 1971 with Todd-AO 35, an anamorphic 35MM format like CinemaScope.

### HASTA LA VISTAVISION

If Cinerama had cornered the widescreen market for sheer impact in the '50s, it was VistaVision that clearly captured the hearts of film connoisseurs. Dubbed the "Tiffany of projection methods" by former Paramount chief Barney Balaban, VistaVision was

a masked projection system that achieved its wider image by running a negative through a camera horizontally at a width of eight 35MM sprocket holes (as opposed to the normal, vertical four). The result, when reduced to normal positive prints, produced pictures so clear and vibrant that VistaVision quickly became the widescreen process of choice for cinematographers the world over. An added benefit was that VistaVision's double negative gave exhibitors the option of projecting a movie in virtually any aspect ratio from 1.33:1 to 2.1:1.

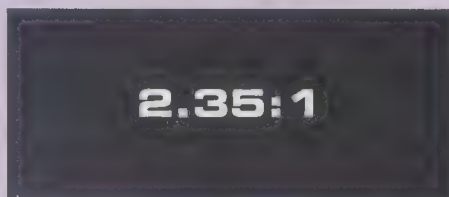
When Paramount introduced the process in 1954, the best way to see VistaVision was in one of the company's Lazy-8 Flagship theaters, where the movie would actually run through a projector horizontally and onto a 30 x 55-foot screen. Height rather than width was emphasized, and true VistaVision was meant to be viewed at 1.66:1.

A showing of *White Christmas* (1954), the first VistaVision film, began with a black-and-white newsreel on a screen that was masked to standard size by the stage curtains. After the newsreel, the words "Paramount Proudly Presents the First Picture in..." appeared—at which point, a giant V filled the screen. Suddenly, the curtains parted, the stereo sound kicked in, and the full VistaVision logo came into view. Eventually, the *White Christmas* title, displayed on a deep red background, would explode across the entire screen. Audiences ate it up.

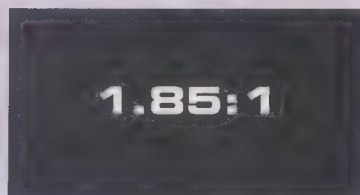
Bing Crosby, the star of *White Christmas*, once told me he felt that VistaVision was the real attraction of the show. Two years later, when he coproduced *High Society* (1956) at MGM, he adamantly insisted that the production be shot in VistaVision instead of CinemaScope. Alfred Hitchcock loved the process' quality and flexibility, and when he made a rare foray over to MGM, for 1959's wonderful *North by Northwest*, the Master of Suspense decreed that the production be lensed in VistaVision.

Even widescreen nemesis John Ford demanded VistaVision for *The Searchers* (1956), considered by many to be the best VistaVision film ever made. Though Paramount suggested that theaters project VistaVision films for general release in the standard widescreen 1.85:1 ratio, and most laserdisc-version VistaVision titles are

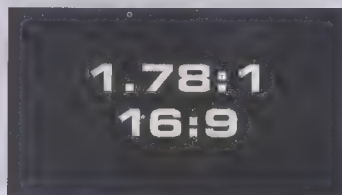
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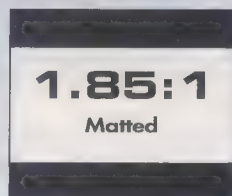
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at 1.85:1, *The Searchers* disc is closer to 2.1:1.

Paramount/LDC's disc of *Funny Face* (1956), on the other hand, is letterboxed from original VistaVision elements to a 1.66:1 ratio. Though minor negative and camera scratches move across the frame (rather than up and down, as they would with a conventional vertical process), it's still one of the best-looking laserdiscs ever and remains an extraordinary reminder of the capabilities of this incredible process—essentially, the quality forerunner of IMAX.

As fine as it was, however, VistaVision was phased out after a scant 7 years. When it was decided that 1961's *One Eyed Jacks* would be the final VistaVision release, the brilliant cameraman William Daniels declared that he felt like going into mourning.

Today, the old VistaVision equipment is still in use, having been modified by the wizards at George Lucas' Industrial Light & Magic. The process' incredible clarity and color retention make it perfect for working on complicated special effects whose final incarnation may be generations removed from the original material. The use of VistaVision gear, with its horizontal film magazines, is plainly visible in *The Making of Jurassic Park* (1995),

the recently released documentary about Steven Spielberg's 1993 blockbuster [see "SoftWire," page 78].

The consolation for the loss of VistaVision was Technirama, a 2.35:1 Technicolor process that was introduced in 1956 and coexisted briefly with VistaVision until it replaced it. Using 35MM film stock and modified VistaVision cameras, Technirama brought together VistaVision's horizontal, eight-perf negative with CinemaScope's anamorphic approach. The result was a screen as wide as CinemaScope's, but a picture that benefitted from twice as much film area per frame. Its astounding clarity and rich color approximated VistaVision, and Technirama remains the best pure anamorphic process ever created. When Kirk Douglas first saw *The Vikings* (1958), the Technirama picture he'd just produced and starred in, he couldn't believe the quality and raved that it was the best color he'd ever seen. When Stanley Kubrick's *Spartacus* (1960) went into production shortly thereafter, Technirama got the nod.

Technirama is perhaps best known for the lush imagery on the Samuel Bronston epics *El Cid* (1961) and *King of Kings* (1961), which, like *Spartacus*, were released in Super Technirama 70, a 70MM version. I once asked Nicholas

Ray, director of *Kings*, if Super Technirama 70 was indeed a large-format negative or if the studios had simply taken advantage of Technirama's outstanding quality by blowing up 35MM images. He swore (and I mean *swore*) that 70MM equipment was used—not only on the Bronston films, but on *The Savage Innocents* (1961) as well. (He couldn't help but snap, "But what do I know? I was only the director!") Sadly, Technirama disappeared as the '60s turned into the '70s.

## REALITY BITES

Despite the excitement generated by the early widescreen extravaganzas, most theaters weren't set up to handle the biggest of the big-screen films. When Fox released *The Robe* in CinemaScope in 1953, it wreaked havoc among theater owners. By then, the movie industry had already voted to begin releasing nonanamorphic productions in del Riccio's original 1.85:1 ratio, which, as mentioned, is still in use today as the theatrical widescreen standard known as The Golden Ratio. In '53, some theaters had already completed the upgrade from 1.33:1 to 1.85:1, but many others still stuck by their old screens. And at that point, only a very few theaters could or would

CONTINUED ON PAGE 90

## HOT PICKS: SELECTED WIDESCREEN CLASSICS

*Apartment, The*. 1960. MGM.  
*Battle of the Bulge*. 1965. Warner.  
*El Cid*. 1961. Image.  
*Fall of the Roman Empire, The*. 1964. Image.  
*55 Days at Peking*. 1962. Image.  
*Gigi*. 1958. MGM.  
*Howards End*. 1992. Warner.  
*How the West Was Won*. 1962. MGM.  
*Invasion of the Body Snatchers*. 1956. Criterion.  
*It's A Mad, Mad, Mad, Mad World*. 1963. MGM.  
*Jurassic Park*. 1993. MCA/Universal.

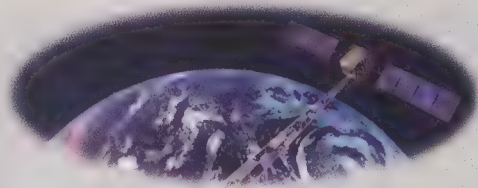
*Khartoum*. 1966. MGM.  
*King of Kings*. 1961. MGM.  
*Land of the Pharaohs*. 1955. Warner.  
*Napoleon*. 1927. MCA.  
*North by Northwest*. 1959. Criterion; MGM.  
*Oklahoma!* 1955. Image; FoxVideo.  
*Once Upon a Time in the West*. 1969. Paramount.  
*Rebel Without a Cause*. 1955. Warner.  
*Remains of the Day, The*. 1993. Columbia TriStar.  
*Robe, The*. 1953. Fox.

**Abel Gance's *Napoleon* triptych**

*Searchers, The*. 1956. Warner Bros.  
*Silverado*. 1985. Criterion; Columbia TriStar.  
*Spartacus*. 1960. Criterion; MCA.  
*Ten Commandments, The*. 1956. Paramount.  
*Terminator 2: Judgment Day*. 1991. Pioneer.  
*True Lies*. 1994. Fox.  
*2001: A Space Odyssey*. 1968. Criterion; MGM.  
*White Christmas*. 1954. Paramount.  
*Wonderful World of the Brothers Grimm, The*. 1962. MGM.







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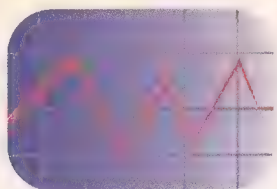
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## VIDEOTEST

# Big Time

**Mitsubishi's CS40505 pushes the envelope on 40-inch direct-view performance**



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IF YOU'RE LOOKING FOR A BIG-SCREEN TV, YOUR OPTIONS are numerous. But know from the start that most of them are costly. Front-projection systems done right may yield the highest quality images, but "done right" will set you back about \$30,000. Rear-projection sets, which are available in a variety of screen sizes and run from about \$2,000 to \$5,000 and more, are improving quickly in their ability to produce truly high-quality images, but they still aren't the equal of tube-driven

sets in the area of image clarity. Tube-driven "direct-view" sets, therefore, are the TVs of choice for the vast majority of shoppers. Mitsubishi has made a point of pushing the tube-size envelope, and they've manufactured the world's largest direct-view tubes for the past 3 years. The CS40505 is one of four second-generation 40-inch TVs, following the CS40FX1, which was introduced in 1992.

At a suggested retail price of \$3,499, the CS40505 isn't inexpensive by most standards, though it is less than \$200 more than Mitsubishi's top-of-the-line

35-incher, the CS35804. So the real questions are: What do you gain, and what, if anything, do you lose as you move from 35 to 40 inches?

If space is a factor in your buying decision, you should take note of this baby's massive girth. It measures 31.75 x 38.2 x 26.8 inches (h/w/d) and weighs a hefty 250 pounds. Cosmetically, the set is simple and attractive. Its standard matte charcoal color is the norm these days. The speakers are mounted in external cabinets positioned toward the rear of the tube and angled slightly outward, which makes them practically in-

visible when you're seated directly in front of the set.

The 40505 has every manner of input a videophile could want. It sports three full sets of inputs with S-Video, composite video, and audio jacks—two are located on the back panel and one is on the front panel, for convenient hookup of dubbing VCRs, camcorders, or videogame consoles. There are also two antenna inputs on the rear panel. This is particularly useful for DSS owners, who'll need to connect a rooftop antenna or cable-TV lead for the local broadcast feeds that usually aren't available from DirecTV and USSB, DSS's program suppliers. The set also provides two sets of audio and video outputs for connection to an A/V receiver and/or external amplifier.

There are plenty of user and convenience features, including single-tuner PIP and the Active A/V Network, which lets you connect the 40505 to compatible Mits components and control the whole batch with the TV's remote. Parental lock lets you lock the entire

**BY KEVIN MILLER**



TV or a single channel; the set is unlocked via a secret PIN number. Super-Quick-View lets you program up to 10 favorite channels and then cycle through them at the touch of a button. The 40505 can also be set to turn on at a specific time or turn off in 120 minutes or less. The set will also display Extended Data Services (EDS) data—time and channel, as well as program details—if they're being broadcast in your area.

The sound system, which includes a 20-watt rated amplifier, is standard-issue. If you're going to invest this kind of money in a TV, you should augment it with a standalone audio system; that's the only way to really get the most out of the programs you want to enjoy.

As with the CS35801 35-inchers ["VIDEO Tests," May 1995], the 40505 offers three color-temperature settings: HIGH, MIDDLE, and LOW. The set also offers three color-decoder presets: ACCURATE, AVERAGE, and SKIN TONE. The presence of the ACCURATE setting is a welcome rarity. There's also a defeatable video NOISE REDUCTION circuit. The tube is a Black-Matrix CRT that features an Invar Shadow Mask and a Digital Dynamic Comb Filter.

The remote's buttons are varied in size and well laid out. All of them, with the exception of those under a sliding door, can be backlit. Like most Mits remotes (and unlike many others), this one is intuitive and easy to use. The on-screen graphics are also well implemented. They don't interfere with your

efforts at adjusting the set, as the bar graphs and legends denoting the picture controls come up one at a time and are fairly small.

Though simple observation as well as workouts with the *A Video Standard* test disc showed that the 40505's factory picture settings were far from optimum, they weren't as far off as many other sets. Though CONTRAST and SHARPNESS were set way too high, for example, BRIGHTNESS (black level), COLOR, and TINT were correctly set. After lowering CONTRAST to the one-eighth mark on its graphic, however, I needed to raise BRIGHTNESS to its two-thirds mark. This CONTRAST setting resulted in 24.5 footlamberts of light output, an excellently linear figure for such a huge tube. Bringing SHARPNESS all the way down to its minimum setting eliminated all of the video noise I detected in the picture. I left COLOR and TINT in their factory-set middle positions, which proved to be perfect with the ACCURATE color-decoder mode.

Gray-scale delineation was mediocre, which indicates a weak power supply. Overscan measured about 8 percent; this is 3 percent more loss than I consider acceptable. Using a laserdisc source, I measured 400 lines of horizontal resolution, 500 lines vertical.

Color temperature in the HIGH mode measured 8,170 degrees Kelvin. The MIDDLE mode measured 7,880 degrees K, and LOW measured 7,320 degrees K. While all of these figures are on the blue side of the color-temperature scale, they're much closer to the 6,500-

## BY THE NUMBERS

Measurements by Berger-Braithwaite Labs

**Horizontal resolution:** 400 lines

**Picture S/N:** video, 55 dB; chroma AM, 63 dB; chroma PM, 63 dB

**Color temperature:** HIGH, 8,170° K; MIDDLE, 7,880° K; LOW, 7,320° K; memory would not hold calibration

**Screen brightness:** before adjustment, 55.5 footlamberts; after adjustment, 24.5 footlamberts

degree NTSC standard than the settings offered by most sets.

The 40505 proved to have the most accurate color decoder I've seen on a consumer-grade TV. The ACCURATE setting decodes the signal in a straightforward, unbiased manner. The AVERAGE position intends to correct for anomalies in fleshtones and biases the decoder to translate tones that are close to flesh into a warmer color of flesh. And SKIN TONE provides an even stronger bias than AVERAGE. By definition as well as observation, the ACCURATE setting is preferable.

Calibrating the set proved problematic (as it had with the CS35801 35-inchers). The job can be tackled via the remote, but when I tried to get the set to memorize my adjustments, it didn't lock onto them precisely. Mitsubishi should correct this situation. If you get the set professionally calibrated, I'd recommend using the LOW color-temperature setting for night-time viewing with well controlled lighting. You could then use the MIDDLE or HIGH settings for daytime viewing, when more ambient light is present in the room; to compensate for it, simply raise CONTRAST and BRIGHTNESS a few clicks.

Watching a variety of reference movie scenes showed that the CS40505 definitely has a better picture than the first-generation CS40FX1. It also delivers a sharp, virtually noise-free picture, surpassing the CS35801 35-inchers in both regards. And the extra 5 inches of tube size definitely adds impact—without compromising picture quality whatsoever.

WHEN THE SUBJECT IS BIG-SCREEN TV, direct-view tubes circa 1995 don't get any larger than the one in Mitsubishi's CS40505. This 40-inch set isn't inexpensive, and it isn't small. But its combination of a huge, sharp noise-free image and dead-on color accuracy is hard to resist. ■

## THE SHORT FORM

### MITSUBISHI CS40505

**Component type:** 40-inch direct-view TV

**Price:** \$3,499

**Target:** Videophiles, movie buffs, and serious home-theater enthusiasts

**Minimum requirements\*:** Hi-Fi VCR, A/V receiver, main, center, and surround speakers

### KEY FEATURES

- Largest direct-view CRT available ■ Three full sets of A/V inputs
- Three S-Video jacks ■ Two antenna inputs ■ Single-tuner PIP
- Active A/V Network ■ Parental lock ■ Favorite-channel bank
- Three color-temperature settings ■ Three color-decoder presets
- Digital comb filter ■ Extended Data Services display ■ Wireless remote

### SUMMARY

- Plenty of useful convenience features and connections ■ Most accurate color decoding we've seen ■ Memory could not hold calibration precisely
- Delivers big impact and sharp, noise-free images

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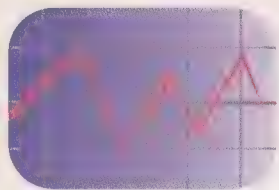
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# VIDEOTEST

# Little Big Man

**Sony's KP-41T15  
comes close to being  
a worldbeater**



**TEST  
809**

IF THERE'S A TREND IN THE TELEVISION-SET BUSINESS these days, it's "big." Sometimes it seems that manufacturers would drop a 20-footer into our homes if they could just get us to lift up our roofs for a minute.

Most of us, of course, only have normal rooms—not dedicated theaters—to fill with home-theater systems. Ask anyone, though, and they'll tell you they still want a big theater-like picture. Enter Sony's KP-41T15. With its 41-inch screen, it's the smallest

big-screen rear-projector you can buy.

Part of Sony's new Videoscope line of projectors, the 41T15 (shown with its optional base) is designed to be as flexible as a direct-view set—that is, it fits easily on a tabletop and offers the big picture without weighing a ton or taking up huge amounts of space. The 41T15's price—\$2,199—is also very competitive, matching up well against big direct-view sets and other low-priced rear-projectors.

The set measures in at 39.45 x 37.5 x 23.25 inches (h/w/d) and weighs a trim 113 pounds. The front panel offers a

power button, controls for adjusting volume and channel, a SET UP button, a TV/VIDEO selector, and a MENU button. It also has two LEDs—one lights when the timer is programmed, the other when the currently tuned program is being broadcast (and received) in stereo.

The 41T15 is modestly provisioned in terms of connections. Around back, you'll find two video inputs; of these, only VIDEO 1 offers an S-Video connection in addition to RCA jacks. Two corresponding audio inputs are supplied. Outputs include one set for audio

and video and one audio-only jack. There's one antenna input. The Control-S input/output lets you connect other Sony products with Control-S capability and operate all of them with one Remote Commander remote. The front panel adds another set of RCA A/V inputs.

Inside the set are three 7-inch CRTs with liquid-cooled hybrid lenses. The screen is a lenticular Fresnel, and the comb filter is standard (analog) glass.

The 41T15 has an MTS stereo tuner. Soundtracks are reproduced by two 3.9-inch speakers, which are driven by an amplifier that's rated to deliver 7 watts to each speaker. There aren't any terminals for connecting external speakers, but there is a two-mode ambience synthesizer.

The 41T15 offers single-tuner PIP. The PIP window can take one of two sizes and be positioned in one of four places on-screen; the PIP can be frozen or swapped with the main image. Channels you deem objectionable can be locked. The remote is slim and has

**BY PETER BARRY**



small buttons, but it does the job; unfortunately, it isn't illuminated.

The SET UP function, which can also be accessed via the remote, is where all of the action starts. You'll get a choice of either English, French, or Spanish menus. Hit AUTO PROGRAM and the set scans for channels it can pick up via its antenna input, using an antenna or cable lead; if the set is being fed cable channels, it will automatically recognize that fact and set itself to the CATV ON mode. Finally, you're given the opportunity to manually adjust the 41T15's convergence system (more on that in a bit).

A press of the remote's MENU button brings up the main on-screen menu, which offers VIDEO, AUDIO, PROGRAM PALETTE, TIMER/CHANNEL BLOCK, SET UP, and CAPTION VISION options and a cursor for making selections. The cursor can be moved from option to option with the remote's plus/minus buttons. When the cursor is level with the option you want, you hit the remote's RETURN button to bring it up. Though the see-through menus darken the screen a bit, they don't get in the way when you're trying to make picture-quality adjustments.

The VIDEO menu tells you what viewing mode you're in; the options—STANDARD, MOVIE, and SPORTS—are listed in, and chosen from, PROGRAM PALETTE. The VIDEO mode also lets you adjust the PICTURE (contrast), HUE, COLOR, BRIGHTNESS, and SHARPNESS controls. Finally, VIDEO lets you pick a Trinitone (color-temperature) setting—HIGH, MEDIUM, and NTSC STD (for “stan-

dard”)—and turn the video noise-reduction circuitry on or off.

The inclusion of the NTSC STD Trinitone setting, a feature offered by all Videoscope sets, is a real breakthrough. Selecting this setting helps the picture to achieve, or at least closely approximate, the NTSC D6500 broadcast color-temperature standard (the “D” is for “daylight”). This option is ideal when the room in which the set is used can be sufficiently darkened.

Calling up the AUDIO menu lets you make bass, treble, and balance adjustments as well as pick or turn off a simulated surround-sound mode (THEATER OR STADIUM). AUDIO modes include MAIN (stereo), SAP (bilingual programs), and MONO. You can turn the built-in speakers off if you're using a separate surround-sound audio system. And the audio output can be set to FIXED, for external control, or VARIABLE, for control through the 41T15.

PROGRAM PALETTE stores three different groups of video and audio parameters. STANDARD, MOVIE, and SPORTS are the factory presets, but you can replace them with your own groupings.

The timer lets you set the TV to turn off in 30, 60, or 90 minutes. You can also program the set to turn itself on at a specific time and day, whether once, daily, or weekly. CHANNEL BLOCK can be used to lock out channels, and you can do so on a single-event basis, weekly, or full-time.

The SET UP menu lets you make changes to the functions handled by the AUTO PROGRAM mode. You can erase or add channels, give stations call-letter

## BY THE NUMBERS

Measurements by Berger-Braithwaite Labs

**Horizontal resolution:** >400 lines

**Picture S/N:** video, 56 dB; chroma AM, 64 dB; chroma PM, 63 dB

**Color temperature:** NTSC STD, 6,700° K; MEDIUM, 8,400° K; HIGH, 10,500° K

**Screen brightness:** before adjustment, 41.7 footlamberts; after adjustment, 24 footlamberts

IDs, and put 12 favorite stations in a self-contained group. The VIDEO LABEL function lets you label the set's inputs; label choices include VHS, S-VIDEO, LD, DSS, 8MM, and BETA. CABLE ON/OFF, AUTO PROGRAM, language choice, convergence setup, and CAPTION VISION closed-caption options are also on tap.

As with most TVs, the factory picture-control settings made for exaggerated images. Out of the box, the set's PICTURE (contrast) control was maxed, the rest of the settings were at their halfway point, the Trinitone color-temperature control was set to HIGH, and the video noise-reduction circuit was activated. Though the picture at this point was far from accurate (with blooming, oversaturated colors) and quite noisy, I did note that color and brightness were uniform edge-to-edge, with no hotspotting. This is quite an achievement for any rear-projector, let alone a budget model.

Kevin Miller, a professional TV calibrator (and VIDEO contributor), used his color analyzer to get a fix on the Trinitone and brightness settings. The HIGH setting read 10,500 degrees Kelvin with 39.7 footlamberts of brightness, MEDIUM checked in at 8,400 degrees K with 41.4 footlamberts, and NTSC STD read 6,700 degrees K and 41.5 footlamberts. The NTSC STD reading wasn't exactly D6500, but it's still an excellent setting and extremely close to the ideal for a preset—closer, in fact, than any other current TV can manage.

Using the *A Video Standard* test disc, and starting with the NTSC STD setting, I set about optimizing the 41T15's picture. Fine-tuning convergence required a compromise, since the set's single crosshair doesn't indicate what's happening in the screen's corners. I still managed to get it looking good, but the 41T15 would greatly benefit if Sony added the kind of nine-point convergence system that's showing up on many rear-projectors these days. That'd add to the set's cost, of course.

## THE SHORT FORM

### SONY KP-41T15

**Component type:** 41-inch rear-projection TV

**Price:** \$2,199

**Target:** Videophiles, movie buffs, and serious home-theater enthusiasts

**Minimum requirements\*:** Hi-Fi VCR, A/V receiver, main, center, and surround speakers

### KEY FEATURES

- First 41-inch rear-projector ■ Three A/V inputs
- Single-tuner PIP ■ Three color-temperature settings, including NTSC STD
- PROGRAM PALETTE ■ Channel block ■ Wireless remote

### SUMMARY

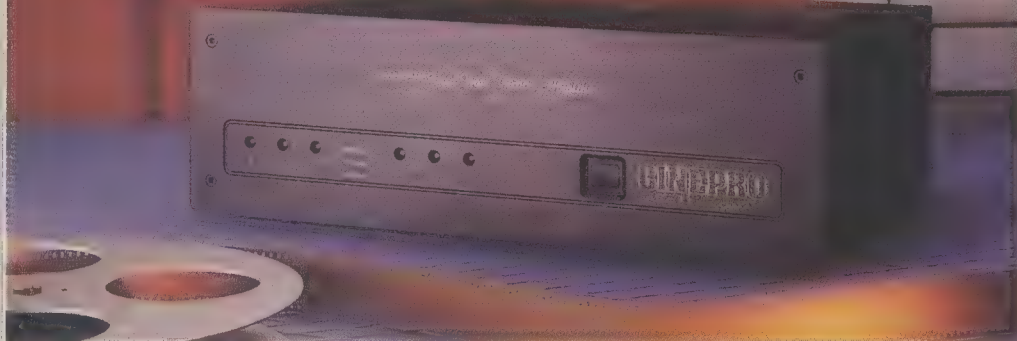
- A small, relatively affordable package ■ NTSC STD setting delivers truest color temperature currently available ■ Excellent edge-to-edge image uniformity ■ Convergence system should be more comprehensive ■ Colors are slightly oversaturated ■ Delivers big, seductive images ■ A very good value

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I set PICTURE to one click below halfway, which resulted in an appropriate footlambert reading of 24. I moved BRIGHTNESS to two clicks below its halfway mark, COLOR to five clicks below its middle, HUE to three clicks below its middle, and SHARPNESS to three clicks up from its minimum. NOISE REDUCTION was turned off. The test disc showed that the 41T15 had good detail in all frequencies and a well controlled power supply; dots in the Color Bar pattern didn't crawl, though ragged edges were evident. Resolution measured 400 horizontal lines and 480 vertical lines.

Though the 41T15's NTSC STD setting is already extremely close to the D6500 standard, the set can be calibrated for precise color temperature. Attempts at improving the NTSC STD setting negatively affected the other settings, however. The routine approach is to calibrate the HIGH setting to D6500 degrees Kelvin. This would automatically shift the MEDIUM setting (and NTSC STD, in all likelihood) down to 5,400 degrees K, which is perfect for black-and-white movies. The net effect would be that you'd have two color-temperature options instead of three, but the two you'd have would precisely conform to the NTSC standard. It bears repeating that the 41T15 is extremely close to the D6500 standard without your paying for calibration.

Tweaking completed, I ran my reference movie discs through the set. Forty-one inches is *big*, and the 41T15 provided a very involving image. The picture weaknesses I saw—oversaturated colors, minor misconvergence, and comb-filter artifacts—are the tradeoffs that accompany making a picture this big for a price this small. In any case, the picture is bright and clear, with little video noise, and the setup options mean that everyone can adjust the picture to their liking.

SONY'S KP-41T15 IS RELATIVELY AFFORDABLE, it has a relatively small footprint, and its picture offers everything you could expect for the price, and more—its NTSC STD color-temperature setting brings you closer to the NTSC standard than any other set you can buy. It's an impressive debut in what appears to be an exciting line. If a pricier 41-inch Videoscope model added things like a more sophisticated color decoder, a 3-D comb filter, and a nine-point convergence system, Sony could have a direct-view worldbeater on their hands. ■

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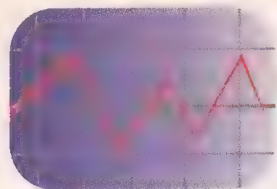
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**VIDEO TEST**



# Music Video

**NHT's VT-2 system is a stellar performer**

**TEST  
810**

HOME THEATER HAS GALLOPED INTO A PERIOD OF maturity that we might refer to as its Golden Age. Though the action is frenetic regarding DSS packages, AC-3 surround sound, and the upcoming DVD, the dust has largely settled in the speaker domain. Clever manufacturers have learned to design speakers that are capable, flexible, and practical for home theater. From Radio Shack's \$300-a-pair Pro LX5 satellites to five-figure multichannel surround systems from JBL,

Snell, Vandersteen, and others, high-performance speakers in all price ranges await the intrepid home-theater builder. NHT's VT-2 Audio/Video Reference System seeks home theater's

middle ground. Neither budget system nor assault on the state-of-the-art, it simply performs like gangbusters.

NHT's home-theater line includes two tower models, a satellite (suitable

for front, center, or surround use), two dedicated center-channel speakers, a quasi-dipole surround, and three powered subwoofer models. Each speaker is finished in a durable, formica-like black laminate. For this review, NHT sent me the best of the bunch, including a pair of VT-2 towers (\$1,750 a pair), the VS-2 center (\$450), one SW3P powered subwoofer (\$1,350), and a pair of HDP-1 quasi-dipole surrounds (\$380 a pair). At \$3,930, the system is far from inexpensive, so my expectations were high.

A deceptively large speaker, the VT-2 is, in effect, two separate speakers that share a single enclosure. A sealed,

**BY ANTHONY CHIARELLA**



shielded midrange/tweeter subassembly occupies the upper portion of the slender front baffle, while a ported, side-firing woofer utilizes the remainder of the enclosure. Four feet tall and a mere 7.75 inches wide, the VT-2's elegant face belies the fact that this speaker is a substantial 18 inches deep and weighs a hefty 66 pounds.

Two significant physical characteristics—the location of the woofer and tweeter—differentiate the left and right models in a pair: Mirror-imaged for optimal treble focus, each speaker should be set up so that its tweeter is closest to the inside edge of the front baffle and its woofer is facing out at the closest side wall when you're looking at the speaker from its front. The VT-2 sits on conical metal feet; cables connect to five-way, bi-wirable binding posts.

If you want your home theater to do as well with music-only programs as it does with movies and other video programs, know that the positioning of the system's main speakers will have a significant effect on the system's performance—and that finding a single location that enables the mains to perform optimally in both types of listening scenarios (video and audio) can be difficult. The problem is that the imaging requirements differ for home theater and "straight" audio. NHT's solution to this dilemma is to empower VT-2 owners with the ability to optimize the speaker for either scenario with a simple flick of a switch.

The switch in question is located di-

rectly below the front speaker grille, and it offers two modes—VIDEO and AUDIO. While AUDIO delivers the precise image focus that audiophiles demand, VIDEO diffuses the soundfield and de-localizes individual images in order to minimize "cognitive dissonance," a phenomena whereby the listener perceives an audio image as disproportionately large compared to the

## Unlike many speakers, NHT's front trio held together across a wide seating area.

video image. Say the VT-2s are placed, for reasons of performance or decor, a good distance to either side of a mid-size to small TV set (one with a 32-inch or smaller screen); if a character in a movie fires a gun, cognitive dissonance may cause the acoustic image of the gunshot to sound more like a cannon shot. NHT tames this phenomena by letting you change the slope of the VT-2's crossover: The AUDIO-mode slope of 12 dB per octave drops to 6 dB per octave with VIDEO.

The VT-2's owner's manual suggests that the VIDEO mode works best when used with smaller TVs, where the speakers are placed relatively far from the set's sides (as in the scenario de-

scribed above). And that appears to be good advice. While I enjoyed the large, diffuse soundfield VIDEO conveyed, in my home theater system, where the VT-2s stood right next to a 50-inch rear-projector, I found that AUDIO granted sharper steering of Dolby Pro Logic elements, greater focus, and more involving special effects. (The lack of woofer shielding had no effect on my TV's picture.)

Designed to accompany the VT-2, the VS-2 employs the same midrange/tweeter array as its big brother. Though its acoustic-suspension enclosure, which measures 7.75 x 19 x 8 inches (h/w/d), is somewhat larger than the average center-channel speaker (especially in the width category), the VS-2 fit just fine on top of my 50-inch rear-projector.

Sonically, the VT-2 and VS-2 are cut from the same cloth. Smooth, dynamic, and utterly revealing, these speakers leave little to be desired—even after repeated exposures to the best their competition has to offer. I was especially impressed by the NHTs' uncommon ability to maintain a balanced tonal presentation across a wide seating area. In short, you can comfortably fit a large number of people into these speakers' sweet spot. (NHT recommends three VS-2s for those putting together an AC-3-based home theater.)

Is such a large center-channel speaker necessary? In answer, I'll point out that the center speaker is responsible for handling the bulk of a movie's dialogue and that, with Dolby Pro Logic, as much as 70 percent of the total audio signal is routed through the center channel. This evidence indicates that you need a good center speaker. Most people can't accommodate a large floor-standing center speaker, of course. Given the VS-2's broad frequency response (75–21,000 Hz  $\pm$ 3 dB), natural tonal balance, impressive power handling, and thunderous output capabilities, it's a remarkably versatile performer that sounds bigger than its size suggests. Home-theater builders should find that it's a natural for center-channel duty, and its admittedly extra-wide stance should only stick out on TVs with 30-inch or smaller screens.

Images produced by the VT-2/VS-2 trio were wonderfully delineated. Voices, music, and sound effects were presented with startling accuracy. Fine details were reproduced so well that the NHTs could serve as a reference for

## THE SHORT FORM

### NHT VT-2 A/V REFERENCE SYSTEM

**Component type:** Home-theater speaker system

**Price:** \$3,930

**Target:** Serious home-theater enthusiasts

**Minimum requirements\*:** A 32-inch TV, topnotch A/V receiver

### KEY FEATURES

- Two VT-2 main speakers ■ One VS-2 center channel
- Two HDP-1 quasi-dipole surround speakers ■ One SW3P/SA-3 powered subwoofer ■ AUDIO and VIDEO modes ■ VT-2's tweeter array is shielded
- HDP-1 has integral mounting bracket ■ SA-3 offers high- and low-pass filters

### SUMMARY

- A stylish package ■ VT-2 appears much smaller than it really is ■ VT-2's AUDIO/VIDEO switch provides helpful setup flexibility ■ The front trio presented voices, music, and sound effects with startling accuracy and fine detail
- Good low-frequency extension and impact from the VT-2s ■ Excellent extension with the SWP3/SA-3 ■ The HDP-1s are fine surround speakers
- The system is an impeccable performer and represents honest value

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speakers that tend to bury details. If pressed to describe the character that they impose upon the final performance, I'd say that their presentation is up-front and immediate, with a slightly forward quality in the upper midrange (explaining, at least in part, their emphasis of fine details).

Note that the VT-2s needed more amplification than their 88-dB/W/m sensitivity rating would suggest. Even at moderate levels, a 100-watt-per-channel receiver couldn't keep pace with the VT-2s' dynamic demands. Clearly, quality as well as quantity is needed in terms of power—as I found when I replaced the receiver with a standalone preamp and a 120-watt-per-channel power amplifier. The benefit to NHT's moderately power-hungry design is that these speakers are capable of an exhilarating dynamic range. From the soft sound of raindrops hitting the surface of a puddle to the shattering of a windowpane and the colossal train wreck in *The Fugitive*, the VT-2s present the totality of a song or a movie sequence with an uncanny sense of proportion. Given a high-quality large-scale soundtrack and sufficient amplification, the NHTs' prowess can be both intoxicating and addictive. To use the VT-2s under such circumstances is like holding the keys to a new Lamborghini: The power is yours to unleash at will.

The VT-2 also impresses with serious low-frequency extension and impact—so much so that I honestly don't know who might need a powered subwoofer (even one as capable as the SW3P turned out to be). The VT-2s are rated to go down to 25 Hz and, in my 35-foot-long room, were only 3-dB down at 28 Hz. Some video and audio programs contain information below 28 Hz, of course, but do you need to hear it so bad that you'll spend the money on, and devote precious living space to, a subwoofer?

If you answered an immediate, rabid "yes!" to that question, know that the SW3P subwoofer is ready to take you all the way down. Note that the SW3P is actually a passive subwoofer that comes with the SA-3 amplifier/crossover. The SW3P takes a 12-inch driver and houses it in the front baffle of a 19-inch cube. The SA-3 incorporates a 250-watt-rated power amp and controls for high- and low-pass crossovers as well as phase and level circuits. These controls add flexibility to the system, as they let you find an ideal blend between

the SW3P and your satellites.

And the SW3P/SA-3 combination definitely added something to blockbusters like *Jurassic Park* and *True Lies*. Try the scene in *Jurassic Park* where you see the puddle in the T. Rex's footprint rippling before you hear the monstrous rumble of his approach. My epiphany came when I added the SW3P/SA-3 to a strict audiophile music system: They provided plenty of low bass, but didn't muddle the airy, open sound of my satellites. There was no unwelcome boominess or overhang—just quick, powerful, pitch-defined bass to the bottom of the audio spectrum. In-room measurements showed that the sub stayed flat down to 24 Hz.

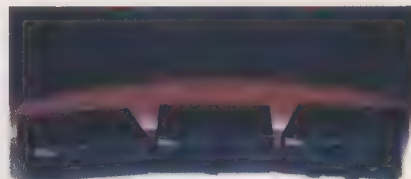
The system is fleshed out by the HDP-1 quasi-dipole surround speakers. The HDP-1, which measures 9.25 x 5.75 x 5.75 inches (h/w/d), is testimony to NHT's penchant for unique design solutions. As opposed to typical dipole surrounds, wherein a woofer-plus-tweeter pairing is located on the speaker's front and rear baffles, the HDP-1 uses a single 3-inch cone driver front and rear plus *one* 4.5-inch woofer positioned directly below a custom mounting bracket on the *side* baffle. Since the HDP-1 is meant to be hung (using the bracket) opposite the listening position on a room's side wall, with about an inch between the speaker and the wall, the woofer and the wall generate "slot-loaded" bass down to about 100 Hz. The overall effect was airy and enveloping, as it should be—and fully the equal of the better bipolar or dipolar designs I've heard.

NHT'S SYSTEM PROVED EXTREMELY SATISFYING, whether I was enjoying surround-encoded movies or selections from my music collection. The VT-2 towers provide a strong sonic presentation, but do a fine job with subtle details and timbres. The VS-2 center/satellite speaker is the ideal complement. The HDP-1s would be a fine addition to any system, and they're an especially good match with the VT-2s and VS-2. And the SW-3P/SA-3 combo can ably fill in virtually all of the bottom octaves in any system that lacks them. Taken together, the system is even greater than the sum of its all-around excellent parts. Considering their impeccable quality and honest value, these are the home-theater speakers I'd recommend to a friend. ■

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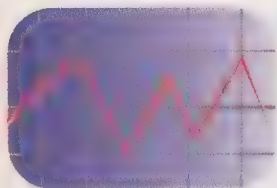
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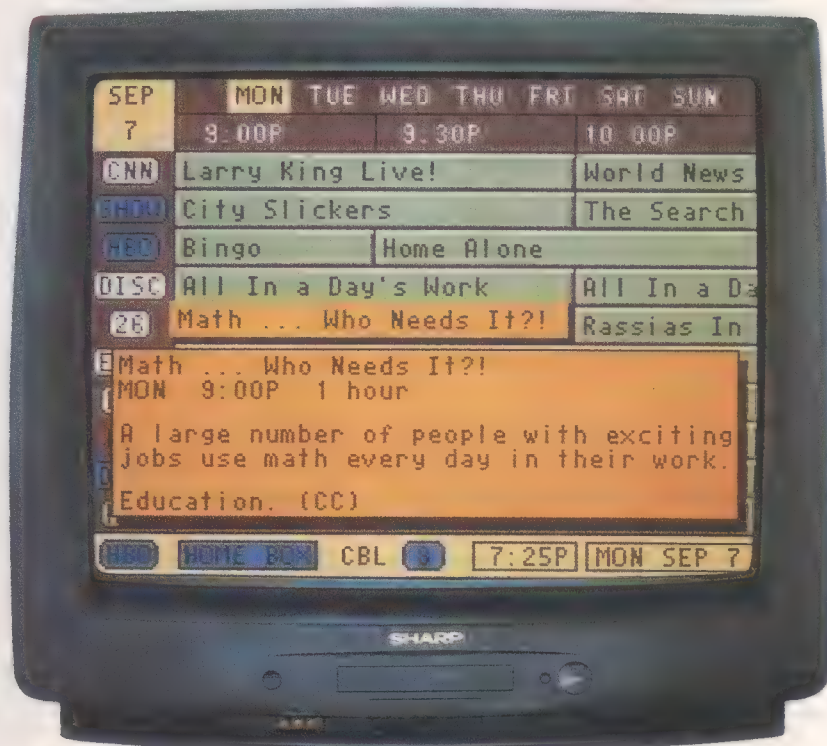




## VIDEO TEST

# Two Timer

**Sharp's 35VX-G2000  
combines a 35-inch TV  
with a Hi-Fi VCR**



TVs AND VCERS ARE INSEPARABLY LINKED. THEY GO together like Tracy and Hepburn, Michael Douglas and victim roles, Inspector Clouseau and "minkeys." In the late '80s, manufacturers started building these two components into a single chassis, and they never looked back. Most early TV/VCRs were portables with small screens and only a few features, and they were usually found in the trunks of cars owned by salespeople. Now larger screens and a generous array of

convenience and performance features are commonplace, so the TV/VCR seems like a viable alternative to a separate TV and VCR in even relatively sophisticated home-theater systems. No other TV/VCR makes this claim as strongly as Sharp's 35VX-G2000, which has a 35-inch screen, a four-head Hi-Fi VCR, and a decoder for StarSight's on-screen program-guide subscription service.

The on-paper benefits of the TV/VCR concept are pretty convincing: The components are pre-connected, utilizing a direct, high-quality

method. Both can be operated by a single remote. Some space savings are usually apparent. And some cost savings should be apparent, too, since the manufacturer can use fewer materials to finish the product. One obvious downside: You'll lose the services of both components if one needs fixing. But we're also wondering whether this combo product cuts some corners compared to otherwise similar, but separate, TVs and VCRs. With these thoughts in mind, I gave the 35VX-G2000 (\$2,379) a thorough evaluation.

Considering that a StarSight-

equipped VCR runs about \$550 these days, we can loosely peg the cost of the 35VX's TV portion at about \$1,829—the entry point, give or take a few bucks, for a 35-incher. Clearly, Sharp wasn't trying to break any performance benchmarks with the 35VX. Convenience and good basic performance are its design goals.

The 35VX looks no bigger than most 35-inch TV sets; it measures 28.25 x 31.75 x 22.4 inches (h/w/d). The VCR is built into the bottom and sits in between the forward-facing stereo speakers. A round power switch is located just to the left of the VCR tape slot, and a set of A/V input jacks are located just below it. The basic VCR transport controls are located to the right of the tape well. Below them, four red LED status lights indicate power/wake-up timer, recording, program timer, and TAMPER PROOF activation (more on that in a bit). A flip-down panel below the tape well offers buttons for record, volume, and channel up/down plus micro-processor RESET.

**BY CLIFF ROTH**



Since the 35VX has only one tuner, you can't watch one program while recording another. And there's no PIN feature—an unusual omission for a screen this big. The basic audio system includes the built-in speakers mentioned previously, an amplifier that's rated to deliver 5 watts per channel, and a simple ambience synthesizer that's conveniently accessible from the remote.

Setup is simple. You just plug in the single AC cord, attach an antenna, and you're in business. You can also plug in a cable-TV lead, of course—a “cable mouse” is on hand to change channels on a cable box. Other back-panel connections include one S-Video input and one RCA A/V input set, one line-level A/V output set, an audio output, and an IR input for the cable mouse.

The remote control has a nice layout and comfortable feel. There are two sets of cursor controls—one for basic operation, the other for the handy StarSight system. The StarSight controls let you navigate the guide's program grid; seven other buttons access other StarSight functions. [For details on StarSight, see “In-Sight,” page 65.] The remote's INTRO SCAN buttons, located behind a slide-down panel, let you automatically scan the first 5 seconds of each program on a multi-program tape; this feature also displays the day, time, and channel number of each recording, handy if you don't immediately recognize a program. The nearby TAMPER PROOF button activates a lock that can be used to keep kids or other mischievous types from changing your programming commands; once activated,

it can only be deactivated by entering a PIN-type code.

The set's on-screen menu is accessed by pressing the remote's MENU button. There are 11 choices from this main menu: CLOSED CAPTION, TIMER, VIDEO ADJUST, AUDIO ADJUST, REPEAT PLAY, CLOCK, AIR/CABLE, LANGUAGE, PB BLUE BACK, CH MEMORY, and CH SEARCH. The timer can be set to the WAKE UP or SLEEP mode, with the latter adjustable to 30, 60, 90, or 120 minutes. VIDEO ADJUST accesses the basic picture controls (more on them in a bit). The AUDIO ADJUST menu turns the set's speakers on and off and has TREBLE, BASS, BALANCE, and RESET adjustments. The REPEAT PLAY menu offers three choices—OFF, TAPE BLANK, and TAPE END. The AIR/CABLE menu has three cable choices—STD, HRC, and IRC. LANGUAGE can be set to English, Spanish, or French. PB BLUE BACK, similar to an LD player's “theater” mode, displays a blue screen and mutes the audio when no video signal is detected or the VCR hits an extended stretch of blank tape. The CHANNEL MEMORY and CHANNEL SEARCH functions don't work when StarSight is activated.

For those who choose not to subscribe to StarSight, the built-in timer system can record up to five events. In addition to the channel number you want to record, you can also select a source (by entering an A/V input) and a tape speed. Daily, weekly, Monday to Friday, and Monday to Saturday options are available; the remote's CONFIRM button will access a display indicating your programming choices.

A menu system is provided for basic

## THE SHORT FORM

### SHARP 35VX-G2000

Component type: 35-inch TV/VCR

Price: \$2,379

Target: Simplicity-minded home-theater enthusiasts

Minimum requirements\*: A/V receiver, main, center, and surround speakers

#### KEY FEATURES

- Single-chassis design ■ 35-inch direct-view TV ■ Four-head Hi-Fi VCR
- StarSight decoder ■ On-screen programming ■ Theater mode ■ WAKE UP and SLEEP timer ■ Parental lock ■ Wireless remote

#### SUMMARY

- Entry-level big-screen images with a Hi-Fi VCR ■ Easy to set up
- StarSight is a handy extra ■ All-around good performance ■ Delivers simplicity and convenience in spades

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picture setup, but it's pretty cumbersome. To get to the basic picture controls, you have to use a separate set of plus/minus buttons to scroll down to VIDEO ADJUST, then press SET to go into a sub-menu, then scroll to your options—PICTURE, COLOR, BRIGHT(ness), TINT, SHARP(ness), F. COLOR (for "flesh color"), or RESET—then press SET for the item you want to adjust, and, finally, use the plus/minus buttons to make the adjustment. To get to another picture control, you have to renavigate the entire menu. One bright spot: Each picture parameter uses a handy numerical scale.

The model I evaluated was a preproduction prototype. Using the *A Video Standard* test disc, I set PICTURE to 50, COLOR to 66, BRIGHT to 32, TINT to 40, and SHARP to its 0 mark. F. COLOR has three settings—RED, NORMAL, and BLUE. The RED position made all fleshtones look similar, while BLUE gave a bluer, cooler cast to the image. To my eye, NORMAL did the best job of producing a variety of believable fleshtones, though there was slightly less variation than I've seen with some other sets. At this point, over-the-air TV looked very good, VHS tapes looked only decent at the SP speed (and a notch below that at EP), and laserdiscs looked good.

Though the set's color decoder seemed only average, the screen's geometry was very good. Convergence seemed reasonably tight, too, considering the screen size. Jitter rendered pictures virtually unviewable in the VCR's pause and slow-motion modes; this problem should be ironed out in full production models.

It's tough to overstate the impact a big screen makes. You fall under its spell even when you're watching nothing but a talking head—when viewed on a 35-incher, David Brinkley and Dan Rather have an imposing, Wizard of Oz-like bearing that makes the news scarier than it normally is. Close-ups on sex symbols can be amazingly seductive. Cityscapes and pastoral vistas invite or repel with unprecedented force. And you better be prepared when you slap on a big action flick—explosions, collisions, and melees can literally rough you up. The 35VX offers this impact in spasms.

TV calibrator (and VIDEO contributor) Kevin Miller measured the 35VX's color temperature at 8,040 degrees Kelvin (high output) and 10,150 degrees K (low output), which indicated

### BY THE NUMBERS

Measurements by Berger-Braithwaite Labs

**Horizontal resolution:** TV, 400 lines; VCR, 240 lines

**Picture S/N (VCR):** unweighted video, 45.4 dB (SP), 40.9 dB (EP); weighted video, 50.8 dB (SP), 48.4 dB (EP); chroma AM, 46.3 dB (SP), 42.8 dB (EP); chroma PM, 47.2 dB (SP), 42.7 (EP)

**Color temperature:** before calibration, 8,040° K; after calibration, 6,775° K

**Screen brightness:** before adjustment, 51.5 footlamberts; after adjustment, 18 footlamberts

**Audio frequency response:** Hi-Fi, 20–20,000 Hz +0.7, –6.3 dB

**Dynamic range:** 63.4 dB

that darker scenes would appear more blue than lighter scenes. The unit was also producing 51.5 footlamberts of light. Calibration brought the temperature down to 6,775 degrees K, and we adjusted light output down to 18 footlamberts (50 on the PICTURE setting). At this point, the 35VX tracked the gray scale fairly well, and these adjustments increased vertical resolution from 400 to 500 lines. In addition, color rendition was noticeably improved, though dot crawl was still evident.

The audio system was average for an entry-model big-screen TV, as I discovered when I popped in a VHS copy of *Lifestyles of the Ramones* and cranked the volume all the way up to maximum for their 1978 hit, "I Wanna Be Sedated." Even at top volume, the sound filled the room and was undistorted, but, like most TV sound systems, it was thin and tinny sounding; raising the bass setting to near maximum (it started distorting at the top setting) improved things somewhat, but optimal tonal balance was still lacking. As always, you need a separate surround-sound system if you want truly good audio performance. Those back-panel variable audio outputs make that a simple and convenient task.

SIMPLICITY AND CONVENIENCE ARE really what the 35VX-G2000 is all about. It isn't a worldbeater in terms of performance, but that's not what Sharp was after. What you get is good (not great) all-around performance, a huge screen, and a Hi-Fi VCR with the option to add the extremely handy Star-Sight program guide in one reasonably sized package for one very reasonable price. Videophiles need not apply, but anyone else might fall for the 35VX's sheer bang-for-the-buck stance. ■



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## ultra-view ▶

**H**itachi's 32UX8B 32-inch direct-view TV (\$1,099) combines UltraVision artificial-intelligence circuitry, an UltraBlack dynamic-focus picture tube, and a three-line digital comb filter. Other features include a multipage illuminated remote, trilingual on-screen displays, a Dolby Surround decoder, a special speaker system, "quick-freeze" PIP, and an output jack for an optional 900-MHz wireless speaker transmitter. The set, which measures 26.3 x 31.1 x 22.3 inches (h/w/d), also features three A/V jacks, including one S-Video input jack. *Circle 104 on reader service card*



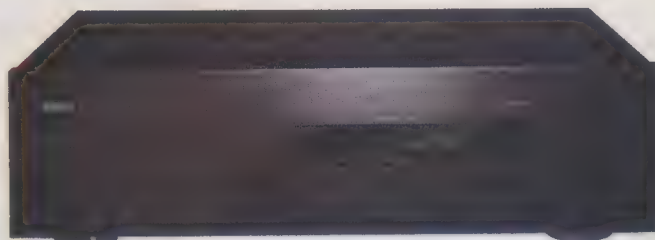
## ◀ wild receiver

**P**ioneer's VSX-99 (\$2,100) is the first A/V receiver to incorporate a Dolby Surround AC-3 demodulator/decoder; Dolby Pro Logic and five DSP surround modes are also provided. The 99 has an AC-3 input, a coaxial digital-video input, and five gold-plated A/V inputs, including two S-Video jacks and a front-panel set; preamp outputs are on hand for the center and sub channels. The 99 is rated to deliver 100 watts into each of five channels in surround mode. Features include multi-room/multisource control with an input for an IR-repeater. *Circle 105 on reader service card*



## due processor ▶

**Y**amaha's DDP-1 (\$599) is the first standalone Dolby Surround AC-3 decoder/demodulator. The processor is equipped with optical digital, coaxial, and RF inputs. Features include a test-tone generator, variable surround- and center-channel delay, separate level controls for the left and right surround speakers, and a variable low-frequency-effects (LFE) filter for each channel. Digital signals pass through 20-bit D/A converters before they hit the DDP-1's outputs. *Circle 106 on reader service card*



## ◀ small sixpack

**C**ambridge SoundWorks' Ensemble IV home-theater speaker package (\$380) is said to be ideal for movie buffs or music lovers on a budget. Compatible with Dolby Pro Logic surround-sound systems, the Ensemble IV consists of five identical satellites and a passive (nonpowered) bass module. The magnetically shielded satellites measure a mere 4 x 4 x 3.6 inches (h/w/d) and house a 3-inch driver. The bass module measures only 6.5 x 8 x 12 inches (h/w/d) and houses a 5.75-inch long-throw woofer with dual voice coils. *Circle 107 on reader service card*





### mod quad ▶

**V**idikron/Faroudja's VP-400 line-quadrupler (\$20,000) is said to convert a conventional 525-line interlaced NTSC signal into a progressively scanned 2,100-line-per-frame signal without showing any scan lines. The 400 incorporates a Super-NTSC decoder, special comb filters, dot-crawl and hanging-dot error correction, and bandwidth-expansion circuitry. It can accept multiple NTSC-composite, Y/C, and/or composite video input and output signals in the RGB or TTL Multi-Sync format. A high-scan-rate monitor is required. *Circle 108 on reader service card*



### ◀ a plug for processing

**A**MC's AV81HT-THX A/V preamplifier/surround-sound processor (\$1,200) is THX-certified. Processing modes include Dolby Pro Logic and THX's enhancement of Pro Logic. Four video inputs, eight audio inputs, three video outputs, and six audio outputs (including one subwoofer output; all are buffered unity-gain types) are on tap. The component's modular design allows processing upgrades; a plug-in Dolby Surround AC-3 decoder module should be available sometime this fall. *Circle 109 on reader service card*

### dolby double ▶

**D**enon's AVP-8000 A/V preamplifier/tuner/processor (\$3,500) performs Dolby Surround AC-3 as well as Dolby Pro Logic decoding and is THX-certified for both surround methods. All surround processing is performed in the digital domain. Eleven video inputs and outputs are on tap, including 10 S-Video jacks. Signals passing through any of the nine audio inputs are processed by 20-bit A/D converters. A special RF input accepts the corresponding output from an AC-3-ready laserdisc player. The 8000's left, center, right, and subwoofer outputs employ 20-bit D/A converters, while the rear channels employ 18-bit D/A converters. *Circle 110 on reader service card*



### ◀ on trak

**R**CA's F35673MB 35-inch direct-view TV set (\$1,499), which is new to the ColorTrak Plus line, is loaded with convenience features. Commercial Skip uses a timer to let you channel-surf during commercial breaks, taking you back to the original channel at a user-defined interval (such as 30 or 60 seconds). Channels can be labeled with their station's call letters, for easy identification. Driven by the LSI-circuit T-chip chassis, the set employs an "optimum-contrast" screen, a dark-glass picture tube, and an analog comb filter. Aspect ratio is 4:3. A full-featured wireless remote control is supplied. *Circle 111 on reader service card*



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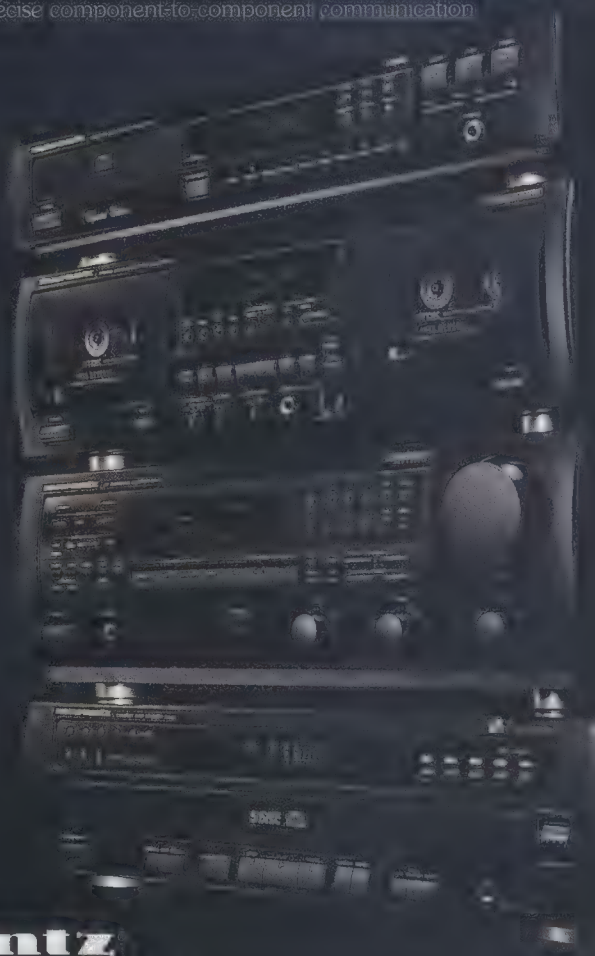
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### ◀ service station

**G**oldStar's GVR-E469 four-head Hi-Fi VCR (\$550) incorporates a decoder for the StarSight on-screen program-guide subscription service. The E469, which measures 3.2 x 14.2 x 12.1 inches (h/w/d), also features auto clock setting and fixed audio-level meters for visual verification of audio recording levels. The multibrand remote can control TVs as well as the VCR and is equipped with a shuttle wheel. *Circle 112 on reader service card*

### max headroom ▶

**M**&K's V-75 powered subwoofer (\$625) features the Active Headroom II Maximizer circuit, which is said to assure maximum output and wide dynamics without clipping or other audible distress. The sub's 12-inch driver is rated to extend down to 20 Hz, and its dual polyamide voice coils and undercut core are said to minimize distortion. The built-in amplifier is rated to deliver 75 watts rms. Active low-pass and passive high-pass filters are supplied to smooth system interaction. The V-75 also offers level and phase controls. *Circle 113 on reader service card*



### ◀ exact change

**S**harp's VC-H948U Hi-Fi VCR (\$440) features the 19-micron Exact-Track video-head system, which is said to assure high-quality recordings even at the slowest recording speed. The VCR features front-panel A/V inputs, a shuttle ring, an auto head cleaner, the VCR Plus+ programming system (complete with cable-box control), and a shuttle-equipped universal remote control. The center-mounted mid-drive chassis is said to reduce vibration and improve both video and audio performance. *Circle 114 on reader service card*

### very digital ▶

**T**he 61-inch TP61E80 (\$4,300)—Toshiba's newest TheaterView rear-projection TV—employs the very digital I<sup>2</sup>C chassis, which is said to improve overall performance and durability. The 61E80 constantly monitors and adjusts key picture parameters to keep images sharp and bright. The digital convergence system can be adjusted with the supplied wireless remote control. Twelve favorite channels can be grouped and scanned at the touch of a button. The 61E80 also features a color-temperature control, extended data services (EDS) reception, and speaker-terminal connections for its built-in center-channel speaker. *Circle 115 on reader service card*







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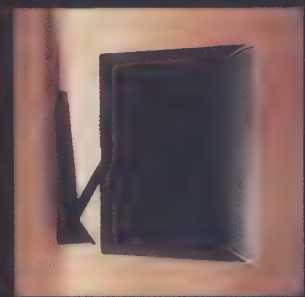
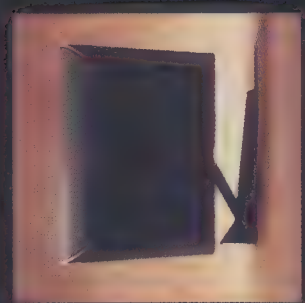
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## In-Sight

### Samsung VR8905 Hi-Fi VCR

**A** FEW YEARS AGO, THERE SEEMED TO be a wide gulf between the abilities of Japanese- and Korean-sourced VCRs, with the latter offering very low prices but not as much in the way of features and performance. Samsung's VR8905 Hi-Fi VCR proves how quickly that gap has narrowed... and maybe disappeared altogether. In addition to offering cable-box control and automatic clock setting, Samsung says the VR8905 (\$549) is the first VCR to come with a built-in decoder for the StarSight on-screen program guide.

Though both the StarSight decoder and the clock-setting feature are built into the 8905, you need some help in order to utilize them. Specifically, you need to be within receiving range of a PBS station (or have one in your cable package) that a) includes StarSight's guide data as part of its vertical blanking interval (VBI) and b) broadcasts the extended-data services (EDS) time-of-day signal (which also includes channel and program IDs). Most, but not all, PBS network affiliates broadcast the StarSight and EDS data simultaneously. It'd be a good idea to call your local PBS station to find out if they do, or plan to, before you seriously consider this VCR (or any other StarSight-equipped product). It's hoped that the proposed cutbacks in federal funding for public television won't affect this technology rollout. Finally, StarSight data will flow into the 8905 only if you call StarSight and subscribe to the service (\$46.92 for 1 year or \$84.96 for 2 years, plus a one-time \$15 sign-up fee).

One thing's certain: StarSight is worth the commotion. Press the GUIDE button on the VCR's remote and a program grid that's similar to a newspa-

per's TV listings, as well as a time-of-day readout, is superimposed over the program on the currently tuned TV channel. The grid covers 1 hour's worth of listings. Above the grid, you'll see a brief summary of the currently tuned program, which is highlighted in the grid. The big cursor control in the middle of the remote lets you navigate your way around the guide; moving the cursor right or left steps through time, while moving it up and down steps through all of the available channels. When you stop on a program, it's highlighted in the grid and its plot appears in the program-summary box. The remote's two DAY buttons let you step through up to a week's worth of listings.

StarSight also makes programming easy: Press GUIDE, step to the program you want to record, and simply press the remote's RECORD button. StarSight will ask what tape speed you want (SP or SLP) and whether you want to record the program once, daily (Monday through Friday), or weekly. Once you've made these selections, pressing RECORD a second time memorizes your instructions. Up to 25 one-shot recordings and five daily or weekly recordings can be programmed. (A conventional, easy-to-use eight-event timer is on hand for StarSight-less on-screen programming.)

StarSight also lets you customize the

grid—you can group frequently watched channels at the front, for example, or group channels by theme. Channels can also be scanned by sports, news, and movies themes.

In most other ways, the VR8905 is fairly conventional, though the true jog/shuttle dial is a bonus. It has a rather square, boxy look. The green display panel is pretty busy (it includes stereo VU level meters, though audio-input levels can't be adjusted), and it can't be dimmed or shut off entirely—I sometimes found this distracting while watching movies. Two small flip-down panels hide A/V input jacks as well as buttons for channel, line input, TV/VCR, record, and master reset, which clears the VCR's memory.

When you're not using StarSight, the remote's cursor controls double as a shuttle control and as SKIP/REPEAT buttons; SKIP advances the tape by 30-second intervals, while REPEAT can either replay the last 5 seconds of a tape or rewind back to the 0:00:00 counter mark and start playing again (you can select a REPEAT mode in the setup menu).

Cable-box control comes in the form of a "cable mouse," which plugs into the back of the VCR and is placed in front of the cable box. The mouse can control up to about 50 brands of cable boxes (the manual provides a list). As usual, you need to enter a code to tell the 8905 which box you have, and the code varies depending on whether you're using StarSight. The manual could be clearer on the subject.

The 50-button universal remote, which also operates 22 brands of TV sets, was easy to use during daylight hours. But at night, with normal living-room lighting, many of the remote's labels were very difficult to read.

Picture quality was good to very good at SP speed; technical editor

Samsung VR8905									
	1	2	3	4	5	6	7	8	9 10
COSMETICS									•
EASE OF USE									•
PERFORMANCE								•	
VALUE								•	
CIRCLE 116 ON READER SERVICE CARD									





Lance Braithwaite measured a horizontal resolution of 240 lines, unweighted video S/N of 44.4 dB, weighted video S/N of 51.1 dB, chroma AM S/N of 44.8 dB, and chroma PM S/N of 40.5 dB. At EP, there was quite a bit of chroma noise, most visible as flashing in red image areas; the numbers here fell to 230 lines, 40.4 dB (unweighted), 40.5 dB, and 39.3 dB, respectively. Hi-Fi audio quality was very good to excellent; the monaural linear-track audio was good at the SP speed, but only fair at the slower EP speed.

Special-effects picture quality was very good, with just a bit of visible noise near the very top or bottom of the screen. The jog/shuttle control offers a surprisingly good range of motion control: Variable fast-search speeds are 3X, 5X, 7X, and 9X at SP, though slow motion is limited to just 1/2X. The frame-by-frame jog dial worked smoothly, with no sudden jumps. Frame-by-frame jogging is also available on the remote control.

Overall, Samsung's VR8905 offers a very good mix of features and performance. And StarSight is truly convenient, especially for programming. My biggest complaint is that the remote's labels are too hard to read—and that says volumes about how good this VCR really is.

—Cliff Roth

## Deep Threat

### Velodyne VA-1215X Powered Subwoofer

**V**ELODYNE IS ONE OF ONLY A HANDFUL of companies that have been making high-quality subwoofers for many years, and they've proved time and again that they're experts at this endeavor. The VA-1215X seeks to bring big, truly low bass into a relatively affordable price range.

The VA-1215X (\$999), which measures about 19 x 18 x 20 inches (h/w/d), uses an integral 250-watt-rated power amplifier to drive a 12-inch woofer. The woofer is assisted by a 15-inch passive radiator. An adjustable (and defeatable) active crossover with a cutoff range of 40 to 120 Hz and a slope of 12 dB per octave is on hand to set the upper limit of the 1215X's operating range.

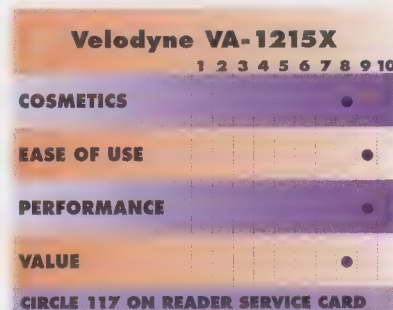
Features include both line- and speaker-level inputs and outputs (the speaker-level jacks are of the dual-banana variety), a passive high-pass crossover that can be used to filter a system's main or surround speakers at 80 or 100 Hz with a slope of 6 dB per octave, automatic activation when a signal is sensed at its inputs, an adjustable phase control, VIDEO and AUDIO equalization settings, a detachable power cord, and—wonder

of wonders—shielding, which means that you can set the sub up right next to your TV set without degrading its picture. The back-panel level control has a lot of range, allowing it to accommodate any possible input scenario.

The 12-inch woofer fires out of the cabinet's front, which is covered by a black fabric grille. The 15-inch passive radiator faces downward from the cabinet's bottom, which is held 2.5 inches from the floor by small marble-finished feet. The 1215X itself is finished in black wood veneer.

Setup is easy if a system has a dedicated subwoofer output: Just run one or two RCA cables to the 1215X's line-level input(s) and pick cutoff and level settings. If a dedicated line-level sub output isn't on hand, speaker wire for both channels must be run from an A/V receiver, integrated amp, or power amp to the sub's speaker-level inputs. Next, another pair of wires must be run from the sub's speaker-level outputs to the main or surround speakers. Then you choose a level and, using the high-pass filter, a main/surround cutoff.

The 1215X is a superlative performer. It kicked out 109 dB SPL with my reference discs, and frequency response at the -3-dB point in my living room reached down to 26 Hz. The higher you set the active crossover's cutoff, the lower its slope will be. The VIDEO equalization setting adds about 3 dB of output above 50 Hz without affecting the crossover slope.



The 1215X is just as impressive to the ear—and your gut. *Terminator 2* and *True Lies* sounded incredibly authoritative, and *Jurassic Park's* T-Rex footstomps rocked the house. Acoustic bass instruments were portrayed with accurate size (string basses didn't sound wall-size), placement in the soundstage, and timbre, with no buzzing, rattling, or obnoxious cabinet noises obscuring subtleties. Organ runs were full, and the 1215X hung tough



with the really low stuff. Special FX CDs with lots of low-frequency content shook the couch and rattled the pictures on my living room's walls—all with superbly stable and robust imaging and staging; no one even suspected that the sub was sitting behind the couch.

In short, Velodyne's VA-1215X is a great subwoofer. It combines deep, loud, high-quality output with slick styling, a fairly small cabinet, full flexibility, and a relatively reasonable price tag. It's sure to stand tall next to the very best of its peers. —Tom Niousaine

## Cost Conscience

### Sherwood RV-4050R A/V Receiver

I'VE ALWAYS MAINTAINED THAT IT'S more difficult to design a good entry-level consumer-electronics component than a no-holds-barred extravaganza. When cost is no object, engineers can build in quality to their hearts' content. No such luck at the other end of the scale: Every time a feature, control knob, or input is added, a bit of performance must be sacrificed to keep the component in the desired price range. It just ain't easy—though Sherwood's RV-4050R makes me want to reconsider my hypothesis. This A/V receiver provides solid power, a nice array of features, and fine performance for an extremely reasonable price.

The 4050R (\$270) delivers 50 watts into each of the left, center, and right front speakers plus 20 watts total for two rear speakers in its surround, home-theater mode; when used to play music in stereo, it's rated to deliver 60 watts into each of two channels. This is solid, if not overpowering.

Connections accommodate two A/V sources and three audio-only sources; you can record on one of each. Chances are good that you won't find the lack of a phono preamp (and input) troubling. RCA pin jacks are provided for all video and audio connections; all video, therefore, is conveyed in composite form. There's one video output for the monitor and another for recording on a

VCR. Connectors for the second VCR exist only on the front panel, and, curiously, they're the only ones that are gold-plated. Their placement is somewhat of a nuisance: To wire a laserdisc player or second VCR into the system and keep the wires reasonably well concealed, you'll have to snake the cables under the receiver. Fortunately, there's room to do that, but I'd rather have jacks for the second input both front and rear with a switch to toggle between them.

The back panel does offer one switched convenience outlet rated at 100 watts max along with a pair of "Digi Link" connectors. These RCA jacks facilitate interconnection with Sherwood components bearing the DIGI LINK II or DIGI LINK III logo. The link permits these other Sherwoods to be controlled from the remote that's supplied with the 4050R.

The tuner can be tuned manually or automatically and has facilities to preset up to 30 stations in memory; it maintains memory for a generous 2 weeks in case of power failure. The presets can also be loaded automatically with the first 30 stations in the band.

The receiver's remote is a 55-button affair with separate groups of buttons dedicated to controlling a CD player, an equalizer, and one or two cassette decks (all Sherwoods). Controls for these three devices account for 22 of the remote's 55 buttons. The 10-key numeric keypad accesses station presets and track numbers on CDs, and six buttons are dedicated to source selection. Three pairs adjust MASTER, CENTER, and REAR volume; another three select the surround-sound mode (OFF, 3 STEREO, and PRO LOGIC). One button cycles through the CENTER MODE possibilities (NORMAL, WIDE, or PHANTOM in Pro Logic, NORMAL or WIDE in Dolby 3 Stereo), another activates the auto-sequencing test-tone generator, and a third—MUTE—attenuates the sound. Up top are the power button, one to activate the SLEEP TIMER (10, 20, 30, 60, 90 minutes and off), a third to dim or quench the display panel, a button to

scan the FM presets, and one to toggle between mono and stereo FM reception. All of the buttons are the same size and shape, and there are a lot of them. They are, however, clearly marked and arranged fairly sensibly, though they're not illuminated.

The front panel is clean and neat, with the input selectors arrayed below the display and the SURROUND selector just above the CD pad; activation of either of the two surround modes is clearly indicated. Tuning buttons are off to the left, the VCR 2/CAMCORDER inputs off to the right beneath the combination volume/tone/balance knob. Normally, the knob adjusts volume, but it "converts" to the other functions when you tap the BASS, TREBLE, or BALANCE buttons arrayed to its left. This is an interesting arrangement you usually see on car stereo products. Two features I did miss: a dedicated subwoofer output, and a control for adjusting rear-channel delay.

The RV-4050R sounds bloody good considering its price! Output power

Sherwood RV-4050R										
	1	2	3	4	5	6	7	8	9 10	
COSMETICS										
EASE OF USE										
PERFORMANCE										
VALUE										
CIRCLE 118 ON READER SERVICE CARD										

was adequate, though it clearly had its limits. The bottom end was solid with my efficient full-range main speakers, and I really didn't miss the sub (though you need one to hear *all* of the sound on a laserdisc, videotape, or CD). The Pro Logic decoder does a surprisingly good job in view of the price of this receiver. Low-level surround-sound effects (for example, bird and animal sounds in a nature scene) came across nicely even when much louder sounds were emanating from my system's front speakers.

On the positive side of the ledger, Sherwood's RV-4050R has decent output power, a fine decoder, and a complex but competent remote. Its limited number of A/V inputs as well as its lack of a subwoofer output and rear-delay control may prove limiting, but that's for you to decide. What it does, it does well! This is a very good budget A/V receiver.

—Alex Retsoff





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**HR-VP628U**

**Hi-Fi**  
STEREO

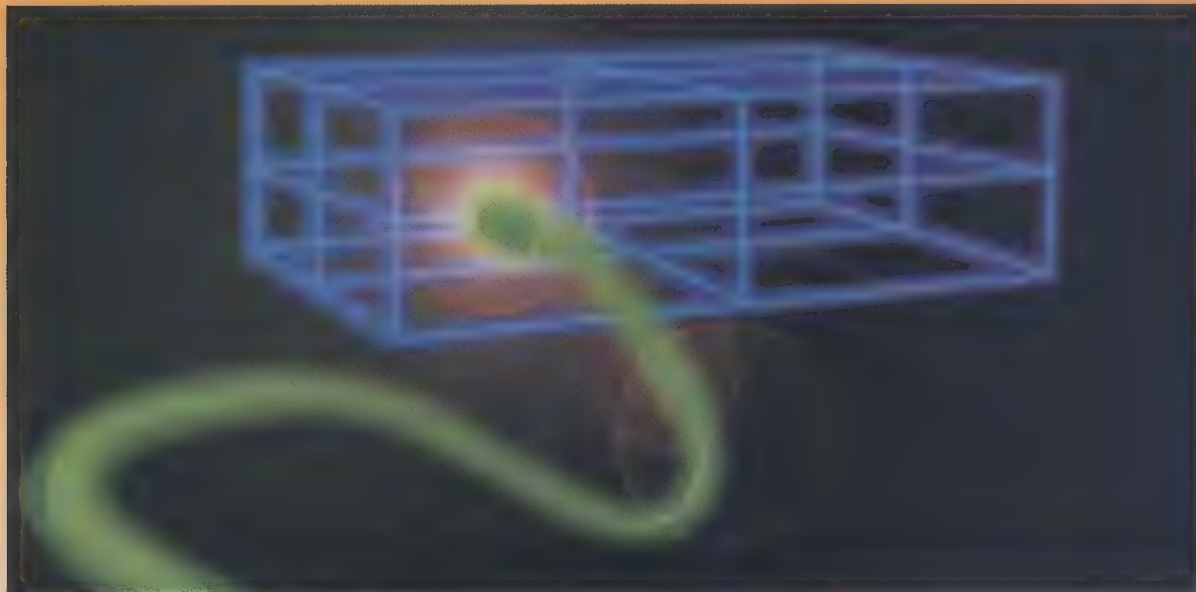
**VHS**

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**JVC**

CIRCLE NO. 12 ON READER SERVICE CARD





## ALTERED STATES

### The Ins and Outs of Upgrading an LD Player for Dolby Surround AC-3

**D**OLBY SURROUND AC-3 IS CLEARLY THE NEXT WAVE IN home-theater surround sound. Though it's currently encoded only on laserdiscs, AC-3's association with the video formats of tomorrow—like the digital videodisc (DVD) and high-definition television (HDTV)—indicate that it's here to stay. As we discovered ["Surrounded," September 1995], that's terrific news from the perspective of sheer performance: AC-3 and its six discrete digital channels are capable of conveying stunning clarity, head-snapping effects, and breathtaking impact, a combination that readily surpasses the formidable capabilities of a comparable Dolby Pro Logic-based system. The prospect of AC-3 poses many thorny questions for upgrade-minded home-theater owners, however. And because the laserdisc currently is the only medium that's being encoded with AC-3's digital bit stream, LD aficionados are asking most of them.

The AC-3 bit stream is encoded in the space traditionally used for an LD's right analog audio track. That leaves AC-3-encoded LDs with only one monaural analog audio track (inserted where the left stereo channel used to be), though the discs also have conventional Dolby Surround encoding. Unfortunately, the loss of the right analog audio track means that owners of early-generation LD players—specifically, those without PCM digital audio sections—can only hear AC-3-encoded LDs in mono. Owners of PCM-equipped players, on the other hand, can enjoy DPL soundtracks when playing AC-3-encoded LDs or, if the player has a special RF output and the home-theater system includes an AC-3 demodulator/decoder, AC-3 soundtracks.

Most new laserdisc players will in-

clude the special RF output, and a dedicated RCA jack will be provided for passing the AC-3 bit stream to an AC-3 demodulator/decoder. The good news is that any older, PCM-equipped laserdisc player can be retrofitted to include this RF output and RCA jack.

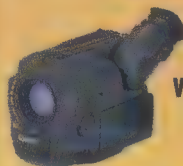
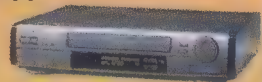
Most LD-player manufacturers don't plan to provide retrofit services, however (McIntosh is the one exception we know of). And it's a very complex process, so it's anything but a do-it-yourself procedure. In fact, an AC-3 upgrade should only be attempted by an experienced service technician. Note, too, that an AC-3 retrofit will void an LD player's warranty, though this may not affect many LD-player owners, since the warranty has already expired on most players that might need upgrading.

MSB Technology [see "Fit and Finished," page 70] is the only company we're aware of that's currently set up to perform the AC-3 upgrade. Other companies may offer this service, however, as AC-3-encoded LDs and AC-3 gear continue to hit the mainstream [see "New Tech," page 59]. If you hear that a company offers the AC-3 retrofit, we recommend that you ask to speak to a technician and refer to the following technical description of the upgrade

process to determine whether they really know what they're doing.

## ON THE INSIDE

### NEW TECH•71



### VIDEOTEST•72

### SHORTWARE•74



AN AC-3-ENCODED LASERDISC DELIVERS the AC-3 bit stream as a quadrature-phase-shift-keying (QPSK) signal via an FM carrier at the frequency previously used for the right analog-audio signal—nominally, 2.88 MHz. Signal voltage ranges from 50 to 200 millivolts, and signal level is -30 dB,  $\pm 1$  dB relative to the video carrier.

The LD player's laser reads the AC-3 bit stream as it would DPL, and it passes the bit stream to the point, or "pin," that supplies the player's audio frequency modulation (AFM) RF output. This pin is located on an integrated-circuit (IC)

ILLUSTRATION BY JEFF MYERS



board, whose location varies from player to player. The technician will need the player's schematic to find the IC and then the pin; alternatively, the technician can get this information by calling the LD maker in question. This pin becomes the RF interface.

One end of a 75-ohm lead should be soldered to the pin. The lead's other end is soldered to an add-on circuit board that supplies DC biasing, buffering, and, possibly, band-pass filtering.

The DC-biasing circuitry performs as a mute control, telling downstream equipment that an AC-3 bit stream is present. When one is, the muting circuit is defeated and adds between 4 and 5 volts DC with a DC impedance of 9,000 ohms  $\pm 10$  percent; when a bit stream isn't present, the muting circuit is activated and adds 0 to 0.5 volt DC with a DC impedance of 100,000 ohms  $\pm 10$  percent.

The signal should be buffered according to good engineering practice. This will prevent cross-contamination of signals as well as protect the player.

The AC-3 spec doesn't require filtering of the QPSK signal, but it's a good idea with no downsides. Specifically, a 2.88-MHz band-pass filter can be used to maintain signal purity.

Unless they've pre-engineered it, technicians won't have this board simply sitting on a shelf in their lab, however. They'll need to round up the appropriate ICs, transistors, resistors, and capacitors, assemble the board, and glue it to a suitable spot within the player. (The board also needs to "steal" power—to run its circuitry—from any convenient point in the player.)

From this board, another 75-ohm lead should be run to a standard RCA connector; a gold-plated jack is preferable for all of the usual reasons. The jack is then attached to the back panel of the LD player and finished. This requires, of course, drilling a hole in an unused portion of the player's back panel.

Note that the AC-3 bit stream should be steered clear of the player's CX noise-reduction circuitry, since it could introduce distortion in the AC-3 output. As an option, the technician could modify the player so that CX is automatically disabled in the presence of an AC-3 bit stream.

IF YOU DECIDE TO PURSUE AN AC-3 upgrade, it pays to know your technician. Inquire about the technician's training. Also find out whether the company covers their work with a warranty; 90 days is standard for repairs. You may also want

to ask the company for references and check whether past customers have had positive experiences with them. Since the AC-3 upgrade isn't especially time-intensive, a competent technician with a light workload should be able to complete it in less than an hour without hurrying—though the initial circuit-board design itself may take several weeks.

As far as cost is concerned, the parts only run about \$20 to \$100 (depending

on their quality), but you also have to pay for labor. That usually runs about \$50 to \$75 an hour these days, so a total AC-3 upgrade shouldn't set you back more than \$100 to \$200 for a basic job. The price may escalate, of course, if only the highest grade components and construction are used. Use our description to quiz a prospective technician, and it should be money well spent.

—Marc Horowitz

## FIT AND FINISHED

### Evaluating MSB's AC-3 Retrofit

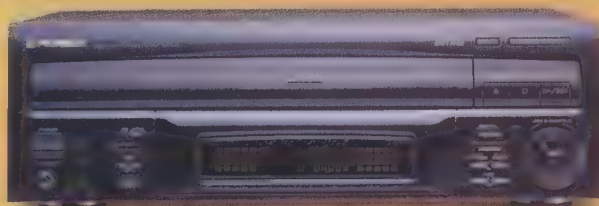
MSB TECHNOLOGY (415.747.0271) IS A RESPECTED supplier of high-performance A/V components. They're also the only outfit that nationally advertises their ability to perform AC-3 retrofits on laserdisc players. So we sent them a laserdisc player for AC-3 retrofitting without telling them who we were.

The first thing we did was purchase a CLD-D702 LD player directly from Pioneer. We selected the D702 (\$1,200) be-

back, to see whether they fell off due to the upgrade or the cross-country trek. Then I sent the unit to MSB via Federal Express' overnight service; enclosed was a personal check for \$445 and a simple note requesting an AC-3 upgrade.

MSB received the D702 on a Friday. By Wednesday of the following week (not on Monday or Tuesday, when we'd expected it), the player appeared again in our offices. It was neatly packed and looked no

worse for wear. Packed in the box was a note from MSB: "Your AC-3 connector is the new RCA connector on the back of the unit. It outputs a modulated RF signal with a DC bias for mute



Pioneer's CLD-D702 survived its trip under the knife

cause it has a PCM audio section, it lacks the special RF output, and its overall quality makes it a likely candidate for this relatively costly upgrade—owners of less expensive, lower performance players may decide that replacing the player makes more sense than upgrading. (AC-3-ready LD players start at under \$500, and that price may drop in the coming months.)

Next, I called MSB's La Honda, California headquarters and told their operator that I needed my Pioneer CLD-D702 upgraded to AC-3. The operator, who was very friendly, replied that if I sent them a personal check for \$385 (they don't take credit cards), I'd have my player back, via standard UPS ground service, in about a week. Deadlines hovered, so I asked if MSB provided rush service. Indeed they did; an extra \$60 would get the D702 back to me 1 day after they received it.

Before we sent the D702 out from our Manhattan offices, technical editor Lance Braithwaite ran it through the lab to make sure that it was working perfectly (it was) and to note its performance figures; we'd check them again after we got the player

control. . . . Your output was measured to be sure it meets all specifications and has been tested with a Dolby Laboratories-approved test disc, demodulator, and decoder. It sounded great."

Lance and I popped the D702's cover and took a good look inside. Close inspection revealed neat work and the use of a high-quality circuit board and external, gold-plated RCA jack. Lance's measurements showed no significant change in any of the D702's performance parameters. Measurements taken from the new AC-3 output revealed a 4.1-volt DC signal with a superimposed AC carrier of approximately 0.4 volts, which is well within the format's specified range. Then we evaluated the modified LD player—with Enlightened Audio Designs' TheaterMaster AC-3 demodulator/decoder, Harman Kardon amplification and speakers, a Mitsubishi front-projector, a Dwin line doubler, and the AC-3-encoded LD of *Forrest Gump*—and were treated to stellar AC-3 performance. Except for the slightly slow turnaround time, our MSB experience was an unqualified success.

—MH



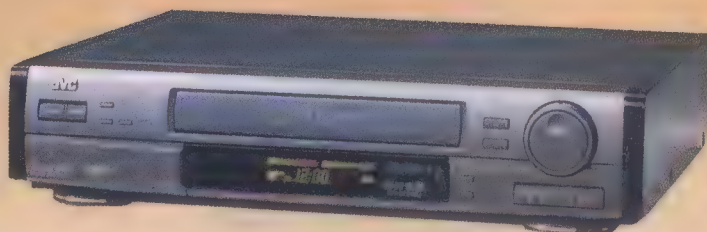


## ◀ like a dock

Sharp's VL-H450U (\$2,499), their flagship Hi-8 Viewcam, includes the Viewcamport, a docking base that provides easy hookup to a TV or VCR as well as continuous battery recharging. The H450U also features a 4-inch color LCD viewscreen with 112,320-pixel resolution, a rotating 270-degree variable-angle lens with 20X digital zoom, and digital image stabilization. Special effects include the ability to take still-image shots as well as create 20-second-long messages and custom fades. *Circle 119 on reader service card*

## digitalized ▶

JVC's HR-S7200U S-VHS VCR (\$1,050) ventures deep into the digital domain. It's said to record unusually clear and sharp images thanks to three digital ICs that optimize the video signal prior to recording. On the playback side, Dynamic Contrast technology is said to improve picture contrast, sharpness, and detail. Editing features include insert editing with a flying erase head, audio dubbing, and random assemble editing. *Circle 120 on reader service card*



## ◀ life's a switch

The SuperSwitch S-1000 (\$89), from Dolgin Engineering, is said to save time and preserve quality while you're editing and dubbing tapes. This S-VHS/Hi8 junction box enables the user to bypass an unused special-effects generator—and the video signal degradation it causes—with the push of a button. The box has S-Video and RCA jacks and can be used as an A/B two-input, one-output S-selector. *Circle 121 on reader service card*

## zoom, zoom ▶

Minolta's Master 8-862 8mm camcorder (\$1,520) is armed with a powerful Tri-Zoom capability—12X f/1.6 optical power zoom, 2X image-enlargement digital zoom, and 1.5X "instant" digital zoom—that can produce up to 36-times magnification. The feature package includes a 0.25-inch CCD image sensor, electronic image stabilization, a color LCD viewfinder, a built-in character generator, and a wireless remote control. In addition to its standard Ni-Cd battery, the 862 can be powered by six AA alkaline batteries. *Circle 122 on reader service card*







## VIDEO TEST

# In the Zone

**Canon's ES2000 sets new standards in image control**



**TEST  
812**

AS THE HOLIDAY SEASON APPROACHES, IT'S INEVITABLE that you'll start to think about past attempts at capturing your festive get-togethers on video. Despite concerted and valiant efforts, you've probably had difficulties coping with focus and exposure realities: Some exposures may have been so muddy that you couldn't tell Uncle Bob from Aunt Irma (difficult, admittedly, even under the best conditions). Your focus mechanism may have done more hunting

than Cousin Woody. And backlighting problems may have obscured the in-laws. (Darn!) You wonder aloud why there isn't an easier way, a smarter camcorder. Well, fret no longer: Canon's ES2000 Hi8 camcorder represents a major qualitative change. If you appreciate innovation as much as quality, this is one cam you have to take out for a test drive.

With the ES2000, Canon has done what very few manufacturers do. Not content to simply improve upon last year's top-of-the-line ES1000, Canon did the right—and most difficult—thing: They jettisoned a model that had some significant flaws and started from scratch. And this time, they

hit—if not a grand slam—a bases-loaded triple.

The ES2000 (\$1,599) offers the high-end features you want on a flagship model—a color viewfinder, optical image stabilization, and a wireless remote control, for starters—as well as point-and-shoot simplicity. At the same time, it boldly remedies its predecessor's weaknesses. The heart of the matter is Canon's unique FlexiZone focus-and-exposure system and the cam's 20X optical zoom. Together, they help the ES2000 push the envelope on what you can accomplish with a camcorder. In addition, revamped playback controls, four exposure presets, a manual-fo-

cus override, and new external-mic and headphone jacks make the ES2000 a more useful and user-friendly package.

The FlexiZone image control system truly is remarkable, as it combines the benefits of manual and automatic controls. This proprietary technology allows you to pinpoint a desired area of focus or exposure *anywhere* within the finder. It operates on three levels: focus, exposure, and titling. It's engaged via the program selector (a round dial on the side of the cam) and controlled by an eight-way rocker that has a concave, thumb-cradling top (located on the back of the cam). The rocker controls a small white frame in the finder: Push the rocker right, for example, and the white frame moves right. Anything and everything that falls within the frame is constantly monitored for both focus and exposure.

FlexiZone lets you pinpoint the focus on any subject anywhere in the frame. This lets you keep a moving subject in focus without moving the camcorder, eliminating unnecessary

**BY STEWART APPLEGATH**



camera movements that might introduce picture jitter. You can also use FlexiZone to smoothly shift focus, directing your audience's attention from one area of the image to another without changing the shot's overall composition. The system is also ideal when positioning subjects off-center or following unpredictable action.

Aside from offering a unique measure of creativity, FlexiZone helps to solve problems that most shooters encounter at one time or another: arbitrary, accidental, or inaccurate focusing, as a cam's focus system misses your intended subject and "grabs" another one instead. Another advantage is gained by holding down the AE button (located just above the rocker), which controls the FlexiZone exposure. You can direct the cam to lock in its exposure reading from the area highlighted by the white FlexiZone frame; the exposure will be determined by whatever falls within the frame. Overly bright subjects, for example, will tell the cam to reduce its aperture. In this way, you can use FlexiZone and AE as a lockable backlight compensator.

Canon has also enlisted the rocker to provide character selection for the cam's two-line titler. Altogether, I found the interrelated systems ergonomically smart, friendly, accurate, and easy to operate. As ingenious as FlexiZone is, however, Canon says that it's only the precursor to a next-generation version we'll see very soon [see "The Eyes Have It," "Fast Forward," page 13].

The ES2000's 0.55-inch color LCD viewfinder has a diopter and a generous array of indicators. On it, tech editor Lance Braithwaite measured 300 lines of horizontal resolution. Because of the lower resolution you get with LCD viewfinders, it was sometimes difficult to see the FlexiZone's focus-shift action when foreground objects weren't close to the camcorder. As a fix, you can move closer to the desired foreground object or zoom in on it. In any case, after seeing how accurate the mechanism was upon playback, I used FlexiZone with confidence.

In addition to FlexiZone, the ES2000 also has a fully manual focus control. The button and vertical thumbwheel that control it can be used in all modes except full auto. The manual shutter-setting options— $\frac{1}{60}$ ,  $\frac{1}{100}$ ,  $\frac{1}{250}$ ,  $\frac{1}{500}$ ,  $\frac{1}{1,000}$ ,  $\frac{1}{2,000}$ ,  $\frac{1}{4,000}$ , and  $\frac{1}{10,000}$ —offer great flexibility when you need to shoot fast-moving or very bright subjects.

The ES2000's other major innovation is the 20X optical zoom, undisputably the longest optical zoom in the world. Zooming from 4MM up to 80MM (the equivalent of 37MM to 740MM on a 35MM camera), this lens is designed to get you closer to distant subjects and scenery, while retaining the image quality that's often sacrificed with digital zooms; minimum focusing distance is  $\frac{1}{8}$  inch wide angle and 2.8 feet tele. Canon says they achieved this balance of range and image quality—without increasing the cam's weight—by using a lighter glass lens and an improved configuration. Image quality is so good

in the maximum zoom position that other manufacturers will need to emulate Canon's system—or go back to the drawing board.

I was also impressed with the ES2000's ability to focus on near-field objects, even when the lens is zoomed in using the tele/rocker control. Most camcorders require that you tele out to a wider angle before you can focus on subjects close to the camcorder.

Canon has been a pioneer in optical

## BY THE NUMBERS

Measurements by Berger-Braithwaite Labs

**Horizontal resolution:** Hi8, 390 lines; 8mm, 240 lines; camera, 450 lines; EVF, 300 lines

**Playback picture S/N:** unweighted luminance, 44.3 dB; weighted luminance, 47.3 dB; unweighted video, 45.3 dB; weighted video, 49.5 dB; chroma AM, 43.5 dB; chroma PM, 43.9 dB

**Minimum illumination:** 11.2 lux for 50 IRE

**Audio frequency response:** Hi-Fi, 20–15,000 Hz +0, –3 dB

**Audio dynamic range:** Hi-Fi, 72 dB

image stabilization, and our tests have shown that optical stabilization generally provides clearer pictures—without image cropping—than the electronic variety. The ES2000 really needs a high-quality stabilization system, given its high-power zoom. And its stabilizer worked: Even at higher zoom settings, it kept the image steady. Its action is smooth, too, and there's no lag noticeable in the viewfinder or on the recorded image. You can't defeat the stabilizer in the full auto mode, and that makes good sense. In FLEXI (manual) mode, you trigger the stabilizer with the dual-purpose PLAY (playback) button. Once it's activated, the stabilizer engages as soon as you power up the camcorder—one less thing to worry about when you want a fast start.

The buttons running along the top of the ES2000 serve two masters: In CAMERA mode, they control ancillary functions like the titler, date, record search, and the stabilizer. Switch to VCR mode and they become regular playback controls. This combination saves space without unnecessarily complicating day-to-day shooting. The buttons are of practical size and their legends are easy to read, a vast improvement over those on the ES1000. Record-search and review functions (9X forward, 7X

CONTINUED ON PAGE 91

## THE SHORT FORM

### CANON ES2000

**Component type:** Hi8 camcorder

**Price:** \$1,799

**Target:** Serious videographers

### KEY FEATURES

- FlexiZone AF/AE image control system ■ 20X optical zoom
- Color viewfinder ■ Optical image stabilization ■ AFM stereo Hi-Fi audio
- Manual focus ■ Seven shutter speeds down to  $\frac{1}{10,000}$  of a second
- External microphone and headphone jacks ■ LANC remote terminal
- Wireless remote

### SUMMARY

- Offers state-of-the-art control over focus and exposure
- Provides high-end features and point-and-shoot simplicity ■ Its optical zoom is unrivaled ■ Lacks special effects ■ Very good image quality
- Average audio quality ■ Sets a new standard in image control

Circle 123 on reader service card



## Battery Packed RCA Pro942 8mm Camcorder

IT'S STRANGE HOW THE MOST OBVIOUS things are sometimes the easiest to overlook. Consider how long it's taken manufacturers to do what RCA has done with its premier 8mm cam, the Pro942 (\$999): It can be powered by ordinary AA alkaline batteries. This is a brilliant addition to a cam that looks great and has a strong roster of features.

I was immediately struck by the Pro942's sleek styling and balanced ergonomics; it's beautifully put together. The battery compartment can hold either the rechargeable battery or six AAs. Two contoured brackets inside the compartment flip up to support the alkalines when they're being used. RCA says the brand of alkalines determines their longevity; new Duracells lasted for 30 minutes.

Like most of this season's higher-end cams, the Pro942's viewfinder is a color model. It's positioned at the back of the camcorder, swings 180 degrees, and stores smartly out of the way. It indicates all of the standard information (zoom, exposure, date) and has a time counter with memory stop and time remaining. I needed to use the stalk's tint control to clean up the finder's image; horizontal resolution is rated at 260 lines.

The 24X digital zoom kicks in at the end of the 12X optical zoom. As with all high-powered digital mechanisms, the image increasingly deteriorates as you zoom past the optical's limit. A button in the middle of the zoom rocker adds a 1.5X "instant zoom"; this comes in handy at points along the zoom continuum, when you don't have the time or patience for the regular zoom mechanism. Considering the big-zoom capabilities offered by the Pro942, you'll probably be using its electronic image stabilizer frequently. It crops the image slightly, but does a good job of steadying it, even at the highest zoom settings.

One problem: I was unable to find an explanation of the automatic-ex-



posure mechanism in the cam's owner's manual. It says the shutter speed is selected automatically, after which the cam adjusts its iris accordingly. In practice, however, I couldn't get it to move above a 1/250-second reading in the viewfinder on a bright day, even though the manual says its maximum setting is 1/4,000 second.

Effects let you enhance scene transitions and give you the option of shooting a 16:9-shaped image. The fade button controls a number of fades and wipes that kick in or out when you start recording or hit pause, respectively. In addition to the standard (white) fade, there's a door wipe (horizontal bars coming together) and an unusual combination zoom/fade—it simultaneously zooms out and fades up white when you start recording, and it zooms in and fades down white when you hit pause. In each case, audio fades in tandem with video.

The 942's autofocus mechanism

worked well—it's smooth and accurate, and doesn't hunt once it reaches its mark. Set the cam on wide angle and it'll focus as close as 1/8 inch. Manual focus is controlled by two

RCA Pro942										
	1	2	3	4	5	6	7	8	9	10
COSMETICS										●
EASE OF USE										●
PERFORMANCE										●
VALUE										●
CIRCLE 124 ON READER SERVICE CARD										

buttons on the back of the cam.

Other features are in abundance: Date search helps you find material you've shot on a particular day. Quick review and edit search let you access your footage with the round playback selector on the back of the camcorder. Audio and video dubbing as well as synchro-editing capabilities can be accessed with optional equipment. The package includes a functional wireless remote. And there's a battery-refresh function on the charger, which is not yet (but should be) standard equipment on high-end models.

Picture performance was good for the 8mm format. Technical editor Lance Braithwaite measured approximately 240 lines of horizontal resolution for the VCR, and the Pro942's

### TECH TIP

If your VCR has an indexing feature, it's easy to "kill" commercials when watching a show you've taped. During your first viewing, simply hit INDEX every time a commercial break ends. During subsequent viewings, trigger INDEX and then FAST-FORWARD when the break begins; when it's over, your VCR will stop and all you have to do is hit PLAY.

Igor Geisbacher  
Brampton, Ontario



color rendition was pleasing. Since camcorders regulate battery voltage down to 5 volts regardless of the power source, performance shouldn't falter when the AAs are used. (It certainly didn't to the eye.) Audio performance—the 942 is equipped with monaural sound, and RCA output jacks are provided for transferring material to your VCR—was average.

Kudos to RCA for implementing a simple but powerful idea. The ability to run the Pro942 with common alkaline batteries means that you can use it virtually anytime you want—not just when its rechargeable battery is juiced. The alkalines may not keep going and going and going, but they'll do a fine job of carrying you through emergencies.

—Stewart Applegath

## Memories

### Delrina Echo Lake Multimedia Family Album

**T**ELLING FAMILY STORIES IS THE main reason most people buy camcorders. And editing your footage lets you weave a tale that spans generations. Multimedia computers offer even more potential, since they work with photos, text, audio, and camcorder footage. Delrina seeks to bring all of these capabilities together in one easy-to-use package.

*Echo Lake* is available for *Windows* in both 3.5-inch diskette (\$50) and CD-ROM (\$60) versions. Delrina recommends a 486/33 *Windows* computer running *MS-DOS 5.0* or higher, an SVGA monitor, 8 MB of RAM, a video

capture card, and a sound card.

The program enables you to create, edit, or view a multimedia family album. You can also print out various parts or download parts or the entire thing to a CD-ROM disc or a diskette.

The program's interface mimics the rustic kind of desk that you might find in a woodsy mountain cabin. The desk contains navigational and control tools. Since the underlying premise is that the multimedia presentations you'll be designing are albums, everything in the package has a book motif.

Creating an album is fairly simple. Clicking on the OPEN BOOK icon brings you to a "Tree Ring," where events can be set according to time or according to eight preset categories—CAREER, EDUCATION, FAMILY, FRIENDS, HOME, LEISURE, PERSONAL, and TRAVEL. The Tree Ring serves as a Table of Contents and launching pad for any new story you want to create. You can name a story by typing it in the upper-left-hand corner of the page. To input text, hitting ENTER will bring you down into the page's body. *Echo Lake* supports TrueType fonts, so this text can be represented by any accessible typeface.

Clicking on the drawer marked MEDIA lets you access Photo CD, .TIF, .GIF, .JPG, .BMP, .WMF and AVI video files as well as .WAV or .MID audio files. You can also link to other *Echo Lake* stories or albums as well as files in other programs, utilizing OLE (Object Linking and Embedding). Camcorder footage can be digitized with a video capture card. A sound card can be used to record live or prerecorded audio.

### Delrina Echo Lake

	1	2	3	4	5	6	7	8	9	10
COSMETICS										
EASE OF USE										
PERFORMANCE										
VALUE										

CIRCLE 125 ON READER SERVICE CARD

Each time you're done with a page of your story, you can add another page by opening up the PAGES drawer. In addition to a blank page, there are 18 "stationery" styles to choose from. A fairly thorough HELP function is on hand. You can also get basic assistance from the "Balloon Help" displays, which give brief cartoon voice-balloon explanations of what each component does when you touch one with the pointer. It's a good thing these are included, since *Echo Lake*'s "manual" provides only a rudimentary walk-through of the program's features. Tech support is available via an 800 number.

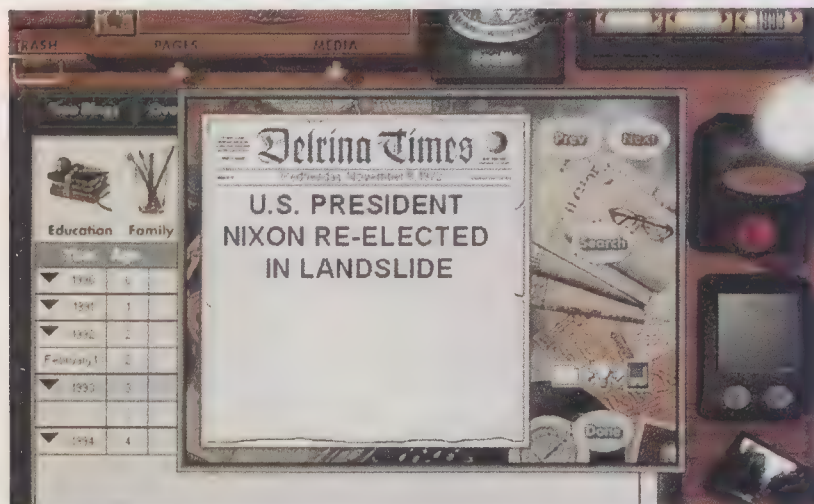
Once you're done with a particular album, you can subsequently enjoy it, edit it, print out the text portions, or download it to send to others.

The PACKAGE mode lets you save an album in its native format or as a "runtime" version that permits anyone with a *Windows* MPC to play the album whether they own *Echo Lake* or not. Note that the runtime option takes up a lot of diskettes, and may cause system conflicts on the receiving computer. The ability to create a "slideshow" of an album, which could run as either an .AVI or .MOV file, would be more efficient and less troublesome.

Delrina clearly was very determined to make the program user-friendly. And it is, in many ways. But, despite its need for a multimedia *Windows* environment, many of the components in its interface aren't anything like *Windows*. And the choices *Echo Lake* gives you for documenting your family's history are too limited.

There's no doubt that an inexpensive, easy-to-use multimedia program for preserving family memories is a great idea. And Delrina's *Echo Lake* succeeds on many fronts. With a somewhat more logical interface and a few more options, they'd have hit the bull's eye.

—Timothy Lieber



Family history in the making: a sample *Echo Lake* screen



ORIGINAL MASTER RECORDING



UDCD 633



UDCD 635



UDCD 638



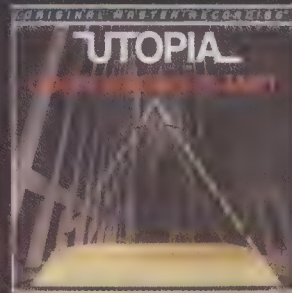
NEW RELEASE UDCD 639



NEW RELEASE UDCD 640



UDCD 634



UDCD 637



UDCD 644



NEW RELEASE UDCD 641

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# SOFT WIRE

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## STAR TREK GENERATIONS

IT'S CLEAR FROM *STAR TREK GENERATIONS*' wonderfully hokey opening sequence—in which retired Captain James T. Kirk (William Shatner) fends off queries about senior citizenship only moments before saving hundreds of lives—that we're in for a special treat with the series' seventh theatrical adventure. Intended to pass the big-screen torch from the original *Star Trek* cast to the *Next Generation* ensemble, *Generations* (Paramount; VHS, priced for rental, CLV/CAV discs, \$45) may just be the most satisfying *Trek* flick yet. Captain Picard (Patrick Stewart), Data (Brent Spiner), and the rest of the *Next Generation* crew seem so invigorated by their lush new surroundings, in fact, that you probably won't miss no-shows like Spock (Leonard Nimoy) or McCoy (DeForest Kelley). On paper, the plot seems uniquely silly: The evil Dr. Soran (Malcolm McDowell) is willing to sacrifice millions of innocent people so he can return to the Nexus, a mysterious "energy ribbon" that presents each inhabitant with their own version of heaven. But thanks to a few doses of self-deprecating humor, everything meshes together beautifully; "I take it the odds are against us and the situation is grim," Kirk says before gamely agreeing to save the universe one last time. Outrageous surround effects and a gorgeous anamorphic widescreen im-



Horse sense: *Generations*' Shatner, Stewart ride into the new frontier

age make the THX-certified, AC-3-encoded laserdisc quite the experience. *Generations* amply shows that there's plenty of life left where no *Star Trek* film has gone before. —Ken Korman

## BOYS ON THE SIDE

IN THE MOSTLY PERKY *BOYS ON THE Side* (Warner; VHS, priced for rental, CLV disc, \$35), three mismatched women leave the grimy East Coast to strike out for the promise of the sun-baked West. Each is an easily identifiable "character"—Whoopi Goldberg is

a lesbian musician, Mary-Louise Parker an uptight princess, Drew Barrymore a boy-happy free spirit. And, just as in its spiritual antecedent, *Thelma & Louise*, the journey depicted in *Boys on the Side* represents the ladies' liberation from their repressive, male-dominated lives. But the initial excitement that comes with the loosening of their shackles is quickly overwhelmed by the screenplay's soap-operaic handling of weighty subjects (pregnancy, AIDS) and the fairly pedestrian direction of Herbert Ross, the play-it-safe veteran of *The Goodbye Girl* and the tear-jerking *Steel Magnolias*. Ross simply drops the ball when it comes to less-typical subjects (like Goldberg's sexual orientation), which get talked about but aren't fully explored. And though the LD is presented in the proper 2:35:1 proportions, most shots appear framed for a facile pan-and-scan job. The LD transfer is somewhat disappointing, too, with muted colors and some mild graininess throughout the presentation. Bottom line: You just might be better off viewing *Boys* in the format that has only one side. —Andy Wickstrom

Wish fulfillment: Goldberg, Parker, and Barrymore in *Boys*





## THE MAKING OF JURASSIC PARK

**V**OICEOVER MAESTRO JAMES EARL Jones hosts and narrates MCA/Universal's *The Making of Jurassic Park* (VHS, \$25, CLV/CAV disc, \$35), an enjoyable 1-hour special that, not surprisingly, drew high ratings during its network telecast last spring. There are oodles of clips from classic adventure films like *The Lost World* (1925), *King Kong* (1933), *Jason and the Argonauts* (1963), and, of course, the big "J" itself, as well as interviews with director Steven Spielberg, author Michael Crichton, and many of the F/X wizards who helped make this dinosaur extravaganza the second-highest-grossing movie of all time. The most intriguing moments, however, are the test footage and false starts, including the amazing tale of what proved to be the most frustrating effect to achieve: how to get perfectly concentric circles to ripple in a glass of water, in order to signify the approach of the T-Rex. On the LD (beautifully mastered and pressed by MCA and LDC), Side 2's bonus goodies let you see the raw odds and ends that didn't make it



Baby doom: Mama (and Papa) Schwarzenegger has his hands full in *Junior*

to the TV broadcast (or the VHS release). Notable entries include a number of go-motion sequences (all shown in 1.85:1), storyboards for the picture's original climax, and some "cute" dinosaur humor scenes. Best of all, perhaps, is the amateur videotape footage of an obviously excited Spielberg and his enthusiastic F/X-team cohorts as they free-associate about visuals that might be scary or just plain cool to attempt—they sound like a group of junior-high-school kids anxiously waiting in line to see 1953's *The Beast From 20,000 Fathoms* (that's a compliment, folks). Overall, *Making* adds to *Jurassic Park*'s already larger-than-life mythos.

—Mel Neuhaus

## JUNIOR

**T**HE THING ABOUT IVAN REITMAN—Arnold Schwarzenegger comedies (remember 1988's *Twins* or 1990's *Kindergarten Cop*?) is that if you've seen the poster, you've basically seen the movie. *Junior* (MCA/Universal; VHS, priced for rental, CLV disc, \$35), which follows the world's first pregnant man (Schwarzenegger) from artificial impregnation to term, is no exception. Fortunately, it's also the most likable entry in the pair's collaborations, thanks to a strong cast that includes the captivating Emma Thompson

as a clumsy labmate, Danny DeVito as Schwarzenegger's partner, Frank Langella as a suspicious university professor, and Pamela Reed as DeVito's pregnant ex-wife. As usual for MCA, the LDC-pressed LD, which is composed in the proper 1.85:1 ratio, looks swell; kudos are also due for the surround soundtrack. A pleasant diversion, *Junior* gives Schwarzenegger the rare opportunity to kill nothing save 9 months—or a little under 2 hours, depending on how you look at it. —MN

## COBB

**T**Y COBB MAY HAVE BEEN ONE OF THE greatest baseball players of all time, but as this warts-and-all biopic takes great pains to show, he just wasn't a very nice guy, on the field or off. In fact, he was known far and wide for his mean disposition (he routinely sharpened his spikes for his feet-first encounters on the basepath) and bigotry. Tommy Lee Jones positively chews scenery with this juicy role—so much so, in fact, that you probably won't mind the film's herky-jerky pace. Director Ron Shelton is a former minor-league ballplayer who's taken to directing likable sports movies (*Bull Durham*, *White Men Can't Jump*), and his expertise comes in quite handy for *Cobb* (Warner; VHS, priced for rental, CLV disc, \$40), especially during one extraordinary sequence that brings the national pastime of the '20s vividly back to life. The film, which is present-



Dino might: Spielberg frames his accomplice in *Making of*...



ed in 2.35:1 on LD, may not be a home-run, but it's not entirely off base, either.

—KK

## **BOB DYLAN** **MTV Unplugged**

**T**HE MYSTERIOUS EVOLUTION OF A certain Robert Zimmerman (Bob Dylan to you and me) continues with *Bob Dylan: MTV Unplugged* (Columbia; VHS, \$20, CLV disc, \$25). It's cer-

tainly ironic that Sir Bob's *Unplugged* sports more electricity than his two most recent studio albums, where his accompaniment consisted only of acoustic guitar and harmonica. During this 73-minute program, Dylan is augmented by a full band, including pedal-steel guitar, dobro, and Hammond organ. (These days, apparently, *Unplugged* means little more than "no electric guitar.") And the band is sharp,

reconstructing Dylan classics like "Tombstone Blues" and "Knockin' on Heaven's Door" into toe-tapping back-porch duende. Though Dylan's vocal delivery has gotten extremely flat over the years, you'll be riveted by the narrative-driven "John Brown" and "Desolation Row." Shots of the mostly twentysomething audience reflect their absolute reverence during these numbers, though they do come to life dur-

## **NOW IN STORES**

### **BILLY MADISON**

1995. Adam Sandler, Bradley Whitford, Bridgette Wilson; dir. Tamra Davis. *Dumb and Dumber* heads into the classroom, as Sandler must reattend—and pass—grade school in order to gain inheritance and the requisite life lessons. Surround. (PG-13) 90 min. VHS, priced for rental; LD letterboxed (1.85:1), \$35. MCA/Universal.

### **BYE BYE LOVE**

1995. Matthew Modine, Randy Quaid, Paul Reiser; dir. Sam Weisman. Three divorced buddies choose McDonald's as the designated meeting place to share the pain of child-rearing. Unfortunately, it's not quite a sequel to *Diner*. Dolby Digital Stereo. (PG-13) 106 min. VHS, priced for rental; LD letterboxed (1.85:1), \$40. FoxVideo.

### **CASPER**

1995. Christina Ricci, Bill Pullman, Cathy Moriarty, Eric Idle; dir. Brad Silberling. The friendly ghost became the summer's high-grossing surprise in a skillful mix of animation and live action (Steven Spielberg executive-produced), with plenty of baby-boomer TV icons adding nostalgia. Digital Surround. (PG) 101 min. VHS, \$23; THX LD letterboxed (1.85:1), \$35. MCA/Universal.

### **CINDERELLA**

1950. Animated. Voices of Ilene Woods, William Phipps, Verna Felton; dir. Wilfred Jackson. The latest rerelease of this immortal beloved includes a newly restored print, a making-of documentary, an illustrated story in a hardcover jacket, and artwork reprints. Stereo. (G) 76 min. VHS: \$27, collector's set \$80; LD full frame, \$30, collector's set \$100. Disney/Image.

### **DERSU UZALA**

1975. Yuri Solomin, Maxim Munzuk; dir. Akira Kurosawa. Kurosawa's masterful tale of an old Japanese scout who takes a Russian survey team into uncharted Siberian territory—and helps them thrive—fully deserved its Best Foreign Film Academy Award. Mono, subtitled. (G) 137 min. LD letterboxed (2.35:1), \$70. The Criterion Collection.

### **DON JUAN DE MARCO**

1995. Johnny Depp, Marlon Brando, Faye Dunaway; dir. Jeremy Leven. A charming

fabale: Brando, a shrink in the midst of a midlife crisis, faces the dilemma of either accepting Depp—an extraordinary patient who claims he's Don Juan, the legendary Latin lover and swashbuckler—or committing him to the funny farm. Dolby AC-3 Digital Surround. (PG-13) 91 min. VHS, priced for rental; LD letterboxed (1.85:1), \$40. New Line/Image.

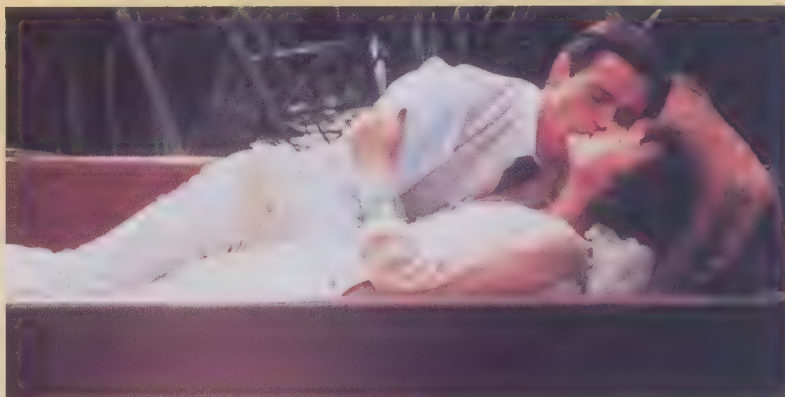
### **IQ**

1995. Meg Ryan, Tim Robbins, Walter Matthau; dir. Fred Schepisi. Albert Einstein

Dynamic Digital Sound. (NR) 110 min. VHS, priced for rental; LD letterboxed (1.85:1), \$40. Hallmark/Image.

### **NEW JERSEY DRIVE**

1995. Sharron Corely, Gabriel Cassius, Saul Stein; dir. Nick Gomez. Call it Car-Jack City: No-hope African-American teenagers cruise Joisey in stolen cars, waiting for the next high-speed chase or ambush by kill-or-cure cops. Digital Surround Stereo. (R) 98 min. VHS, priced for rental; LD letterboxed (1.85:1), \$35. MCA/Universal.



**Soul kiss: Dafoe, Richardson in *Tom & Viv***

(Matthau) faces a conundrum that taxes his genius (and, periodically, the viewer's patience) to the limit—finding the perfect mate for his independent niece (Ryan). Dolby Surround. (PG) 92 min. VHS, priced for rental; LD letterboxed (2.35:1), \$40. Paramount.

### **LOSING ISIAH**

1995. Jessica Lange, Halle Berry; dir. Stephen Gyllenhaal. A powerful and painful drama about a tug-of-love battle between a rehabilitated mother and her son's adoptive parent. Dolby Surround. (R) 108 min. VHS, priced for rental; LD letterboxed (1.85:1), \$40. Paramount.

### **THE MADNESS OF KING GEORGE**

1995. Nigel Hawthorne, Ian Holm, Helen Mirren; dir. Nicholas Hytner. The cracked king's antics threaten to lose him the crown in this Oscar-nominated British import. Sony

### **TOM & VIV**

1995. Willem Dafoe, Miranda Richardson; dir. Brian Gilbert. T.S. Eliot's marriage to a brilliant young lass energizes his work, but their lives soon spiral out of control due to her failing health. Hi-Fi Stereo. (PG-13) 115 min. VHS, priced for rental; LD letterboxed (2.35:1), \$40. Miramax.

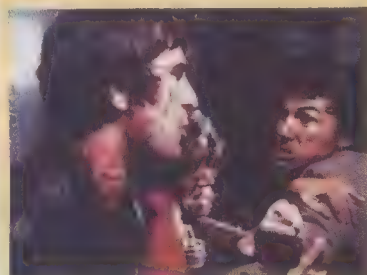
### **WHILE YOU WERE SLEEPING**

1995. Sandra Bullock, Bill Pullman, Peter Gallagher, Peter Boyle, Jack Warden; dir. Jon Turteltaub. A cute, if lightweight romantic comedy about a train-station ticket-taker who's mistaken for a coma-victim's fiancée by his lovable, cloying family. One problem: She's actually fallen for the coma-man's brother. Bullock's presence will keep you wide awake. Dolby Digital Stereo. (PG) 113 min. VHS, priced for rental; LD letterboxed (1.85:1), \$40. Hollywood. —Josef Krebs



## LABELS FOR LESS

THE HOLIDAY SEASON APPROACHES, AND shiny new collections have invaded your favorite video store, all of them eager to be snapped up and transformed into the perfect gift. Paramount is more than glad to help you get to know Jack Ryan (*The Hunt for Red October*, *Patriot Games*, *Clear and Present Danger*), Eddie Murphy's three-headed *Beverly Hills Cop* series, and Leslie Nielsen's *Naked Gun* trio (\$15 each, \$45 set). Warner, meanwhile, offers clusters of Kevin Costner (*The Bodyguard*, *A Perfect World*, *Robin Hood: Prince of Thieves*), Robert De Niro (*GoodFellas*, *Mean Streets*, *Raging Bull*), Mel Gibson (*Forever Young*, *The Man Without a Face*, *Maverick*), Mel Gibson again, this time in a *Mad Max* triple play (\$60 set), a seagoing John Wayne (*Blood Alley*, *Operation Pacific*, *The Sea Chase*; \$45 set), future-world



*Mean Streets'* De Niro, Keitel

fun (*Blade Runner*, *Freejack*, *Outland*; \$50 set), Steven Seagal (*On Deadly Ground*, *Under Siege*; \$35 set), Sylvester Stallone (*Cobra*, *Demolition Man*, *The Specialist*, *Tango & Cash*; \$70 set), and, finally, Robert Redford (*All the President's Men*, *The Candidate*, *Jeremiah Johnson*; \$55 set). If all of that action doesn't quite move you, Fox Lorber provides film for thought with an offering of Andrei Tarkovsky (*Andrei Rublev*, *Solaris*, *My Name is Ivan*; \$20 each). Or perhaps you'd prefer to move into a more sophisticated neighborhood with MCA/Universal's Carole Lombard (*Hands Across the Table*, *The Princess Comes Across*, *No Man of Her Own*, *Supernatural*; \$15 each) and Barbara Stanwyck (*All I Desire*, *Remember the Night*, *The Great Man's Lady*, *Internes Can't Take Money*, *The Lady Eve*; \$15 each). But you'd better hurry—there's so few shopping days left. . . . —JK

ing the country-funkified "Rainy Day Women #12 & 35" (you know, "Everybody must get stoned"). Dylan himself hides behind his shades and interacts with the audience only rarely, but he does address the gathering after a false start to "Like a Rolling Stone" and even

shakes a few hands in the front row after the encore, "With God on Our Side." Arguably the grandfather of the format, Dylan successfully soups up his *Unplugged* and proves once again that he can still shake up the norm.

—Mike Mettler

- ❑ GOING PLACES
- ❑ GET OUT YOUR HANDKERCHIEFS
- ❑ BUFFET FROID

**T**HIS THREE-FILM COLLABORATION BETWEEN director Bertrand Blier and actor Gerard Depardieu (Interama; VHS only, \$150) creates a vivid portrait of French society—one that's every bit as consistent as the picture of Italy created in the work of Fellini and Mastroianni. Depardieu is given a limited range of roles (from thuggish slob to only slightly more sensitive slob), but his uncommon gifts enable him to forge completely individual characters. *Places* (1974) is a wonderfully shocking and politically incorrect farce about two anarchic deadbeats (Depardieu and Patrick Dewaere) who steal from, molest, and generally force themselves upon a petit-bourgeois society that still manages to seem more the aggressor than victim. Much of the plot revolves around the lovable thugs' attempts to liberate spiritually crushed women by way of sex. In *Handkerchiefs* (1978), Depardieu and Dewaere try to bring ■ smile to the face of an unhappy wife. Depardieu befriends a stranger, encourages said stranger to sleep with his wife, and even enlists him to help her

run off with a schoolboy. In both of these films, the characters bend the rules and codes of French society to suit the occasion with all of the wit they can muster. Finally, *Froid* (1979) takes it all to Bunuelian extremes, with its characters driven by dream logic to wander around an apartment complex in search of a killer, a doctor, or maybe just a sane moment in which to take a rest. All three of these films are hilarious and poetic, and they question the logic by which we try to live our lives. What more could a film lover ask for? —JK

## CLIFFHANGER

**R**ESCUE CLIMBER GABE WALKER (SYLVESTER STALLONE) attempts to thwart the schemes of high-tech thief Eric Qualen (John Lithgow) while stranded in Colorado's Rocky Mountains (as portrayed by Italy's Dolomites, actually) in director Renny Harlin's riveting 1993 thriller, *Cliffhanger*. Pioneer Special Editions' feature presentation (CLV/CAV discs, \$100; all-CAV discs, \$125) is identical to that of Live's less-expensive CLV/CAV version—it's got the same dynamic sound and sharp, colorful pictures, which are framed at approximately 2.1:1. But Pioneer has the sweet stuff that Live's version does not—a mountainous array of extras. The commentary track from Harlin, who also oversaw this package, offers the usual directorial anecdotes as well as his philosophy on making violent action movies. Stallone himself took time out from filming *Judge Dredd* to provide



Bait and switch: *Going Places'* Dewaere, Depardieu



insight into such key sequences as the film's terrifying opening scene, in which a love interest (Michelle Joyner) has a rather serious problem with a piece of climbing gear. The star also discusses with great passion and wit the need to overcome his own vertigo. And there's a stylish 59-minute "making of" featurette, presented entirely in CAV, that utilizes split screens, dual audio tracks, and still frames. Two brief scenes that were cut from the movie are quite thrilling: Stallone performs a king's leap across a chasm, then struggles to scale a frozen waterfall. And a novel comparison of the finished film with behind-the-scenes footage illustrates the value of Harlin's elaborate elevator-mounted camera rigs and the general difficulty imposed by the positively freezing locations. These and other examples of Harlin's meticulous attention to detail assure that the punched-up *Cliffhanger* will keep you on the edge of your seat.

—Chris Chiarella

## ROBOCOP

**R**OBOCOP (1987)—PAUL VERHOEVEN'S violent, satiric, SF cult classic, a futuristic hybrid of *Dirty Harry* and *Metropolis*—has at last been released in a THX-certified widescreen version fully authorized by the controversial Dutch director himself. And what a version it is! This *RoboCop* (The Criterion Collection; CAV discs, \$100) contains all of the unexpurgated, bloody "shock" shots that were trimmed from the original's release to avoid an X rating, and these additions are so significant that *RoboCop* nearly emerges as a totally different movie. Flawlessly pressed in Japan, mastered from pristine materials, and presented in a 1.66:1 ratio, this new transfer shimmers with Jost Vacano's clear metallic colors. But it's the mind-boggling soundtrack, featuring Basil Poledouris' pulsating score, that is the jewel in *RoboCop*'s crown. And the exhaustive supplementary section is simply a goldmine: Running commentary by Verhoeven and others, though fasci-

nating and informative, virtually gets eclipsed by the exhaustive text, still frames, and programmable videoclips that discuss, explain, and reveal the secrets behind every major effect in the picture. Extensive storyboards include some scenes that never made it to the finished product, as when *RoboCop* (Peter Weller) visits the gravesite of Murphy, his human "donor." One particularly gripping sequence—the boardroom meeting where the prototype robot brutally dispatches an executive—even gets A-B'd with its filmed counterpart. All in all, this *RoboCop* should make your day. —MN

## LITTLE WOMEN

**S**HUNNING THE ARCHAIC "AMERICAN-sampler" quality of the 1933 George Cukor-Katharine Hepburn production, the current (and fourth) adaptation of Louisa May Alcott's classic 19th-century novel *Little Women* (Columbia TriStar; VHS, priced for rental, CLV disc, \$40) also avoids the candy-



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coated Technicolor schmaltz of 1949's Mervyn LeRoy-June Allyson effort. Instead, this *Little Women* lies somewhere in between the two as a sort of politically correct, literate *Beverly Hills, 90210* rendition. The cast features an attractive batch of Generation Xers (Winona Ryder, Samantha Mathis, Claire Danes, Kirsten Dunst, Christian

Bale, and Eric Stolz), in addition to savvy veterans (Susan Sarandon, Gabriel Byrne, John Neville, and Mary Wickes). This *Little Women* (which is presented in 1.85:1 on LD) is also notable as being the first major-studio effort that's been adapted (Robin Swicord), produced (Denise Di Novi), written (also Di Novi), and directed

## PROGRAM SEARCH

Readers, help readers find these missing links

*Miss Tatlock's Millions* (1948)

Bette Brown

538 Main St.

Oconto Falls, WI 54154

Tapes of *Knots Landing's* 1989-90 season, especially episodes with Penny Peyser (Amanda)

Chris Tutts

1015 S. Ridge Ave.

Arlington Heights, IL 60005

*The Adventures of Robinson Crusoe*

(1952; official release or TV broadcast)

Ken Wolf

12223 Fl. Woods Lane

Orlando, FL 32824

Tapes of tap dancers like John Bubbles, Bunny Briggs, Honi Coles, Don O'Connor, and Eddie Rector (any condition)

Patrick R. Kilcoyne

18205 Ponciana Ave.

Cleveland, OH 44135

*The Idiot* (1957) and *The Brothers*

*Karamazov* (1968)

(in Russian, with or without subtitles)

Oswald Ferrer

4405 NW 73rd Ave.

Ste. 20-50001

Miami, FL 33166

*Knight Moves* (1993), *Gunmen* (1994), *Highlander* (1986), *Universal Soldier* (1992), *The Horror of Dracula* (1958) (Japanese laserdiscs or VHS copies of same)

Matthew Steven Plourde

83 Tanglewood Lane

Naugatuck, CT 06770

Tapes of *Your Show of Shows*, with Sid Caesar and Imogene Coca; Volumes 3-4, 5-6, and 7-8 (already have Volume 1-2)

Clyde Bybee

3107 Porter

Wichita, KS 67204

(Gillian Armstrong) exclusively by women. Geoffrey Simpson's gorgeous photography is finely reproduced in its crystal-clear, Currier and Ives-ish tableaux, though the night-time interiors tend to suffer from oversaturated candlelit "realism." The superb Dolby stereo soundtrack abounds with the proper sounds of the period, and it's elegantly topped off by composer Thomas Newman's beautiful score. A choice showcase, *Little Women* warrants a big thumb's up. —MN

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## MULTIMEDIA



## TECHNOLOGY

## WARP JIVE

IBM's OS/2 Fails to Move an Immovable Object

**W**ELL, IT WAS A VALIANT EFFORT. Remember those commercials—the ones with the perky nuns, harried international businessmen, and the old Russian guys, all of whom extolled the plugged-in virtues of IBM and its new generation of computer products and services? Though the commercials were cute, the really interesting part was that the wizards at Big Blue felt compelled to remind us that they're cool. Hey, one of the perky nuns told us that IBM was mentioned in an issue of *Wired*! How cool can you get?

Sarcasm aside, IBM—despite continued success in the business world—has had a tough time in the last few years connecting with everyday folks like you and me. Our homes are filled with clones of Big Blue's personal computers—not the genuine article. And the vast majority of them use Microsoft's *Windows* operating system. That's a lot of business IBM wanted to regain. The OS/2 *Warp* operating system was their latest—and, probably, last—attempt to turn the tide, but the *Windows* monolith, raised to Babel-like heights by the recent introduction of *Windows 95*, refused to budge.

*Warp* offered multitasking, multithreading, easy Internet access, and a clean interface when it was released in the fall of 1994—in short, most of what *Windows 95* now offers a year later. IBM's recommended hardware requirements weren't a problem, either. They called for a 386 processor or higher, 4 MB of RAM, and 35 to 55 MB of free space on your hard drive. (Okay, you'd probably need a 75-MHz processor, 24 MB of RAM, and a 500-MB hard drive if you really wanted *Warp* to fly.) Viewed in a vacuum, therefore, OS/2's benefits justified the upgrade: It was clearly superior to anything out there before *Windows 95* came to town.

OS/2 certainly represented a step up

from  
*Win-*  
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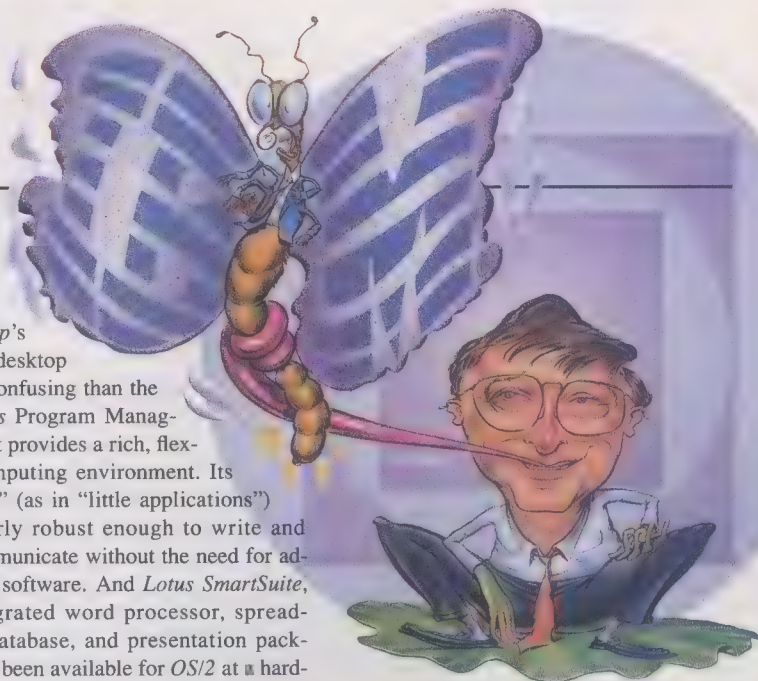
3.1. *Warp*'s default desktop is less confusing than the *Windows* Program Manager, and it provides a rich, flexible computing environment. Its "applets" (as in "little applications") are nearly robust enough to write and telecommunicate without the need for additional software. And *Lotus SmartSuite*, an integrated word processor, spreadsheet, database, and presentation package, has been available for OS/2 at a hard-to-beat street price of under \$150.

Even in a universe in which *Windows 95* didn't exist, however, *Warp* couldn't be mistaken for a perfect operating system. *Lotus* (recently acquired by IBM) was the only major software vendor to support OS/2 in a big way, so *Windows 3.1*, despite its being less versatile, still offered a far greater range of software. Vendors might have flocked to OS/2 if *Windows 95* hadn't been in the pipeline, but it was, so they didn't.

Though *Windows* programs can be run under OS/2, that fact never amounted to much. Think about it for a second: It makes little sense to change operating systems just so you can use the same old programs. The *Warp*-compatible *Lotus* programs, for example, aren't all that different, functionally, from their *Windows* counterparts.

OS/2 also presented some obstacles to upgrading from *Windows 3.1*. Some *Windows* users who attempted the upgrade reported significant installation problems. They also said that they got better application and system support with *Windows*.

OS/2's biggest obstacle, of course, didn't have anything to do with technology per se. It can be summed up in one word: Microsoft. There was simply no way that *Warp* could coexist with *Windows 95* in any significant fashion. No



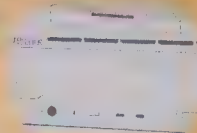
one seemed to admit that in the months before *Windows 95* came to town. Finally, only a few weeks before Microsoft's rollout, IBM CEO Louis V. Gerstner basically threw in the towel, deciding to concentrate Big Blue's OS/2 efforts on the commercial server business.

One thing's certain: OS/2 helped to keep Microsoft on their toes, and that made for a better *Windows 95*. Though it's not much consolation, thanks, IBM.

—Charles Bermant

SAM SISCO

## ON THE INSIDE

SHORTWARE  
84NEW TECH  
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88





## SHORTWARE

### Speed Reader

#### Plexor 6PleX 6X CD-ROM Player

**A**S MULTIMEDIA SOFTWARE PROLIFERATES, cutting-edge games with full-motion video and animation demand faster CD-ROM players. At issue is the player's ability to quickly find data and transfer it to the MPC. The 6PleX, from Plexor, a well-regarded maker of CD-ROM players, is one of the fastest models you can buy.

The 6PleX, which is available in external and internal versions (\$649 and \$549, respectively), is Plug and Play-compatible and among the first 6X players to hit computer shops. It isn't inexpensive, and many folks will be content with a 4X model (and save \$300 in the bargain). But the 6PleX does de-

liver appreciably faster performance than older drives, particularly when graphics data and video are involved.

I saw the biggest performance difference with multimedia games that juggle demanding video, audio, animation, and graphics. Loading scenery data in Microsoft's *Flight Simulator*, for example, was lightning quick. And the animated scenes and graphics in Lucas Arts' *Full Throttle* played smoothly and without delay. Database searches were blindingly fast as well. It didn't hurt that I had a fast Pentium CPU working behind the scenes, but even a quick processor won't help if the CD-ROM player can't deliver data quickly.

A CD-ROM benchmark program called *CD-Stone*, from Stone Utilities, confirmed my initial impressions. The 6PleX turned in much better scores

than the 3X NEC 3Xi player I use. The test program showed that the 6PleX was able to complete random seek operations in 154 ms, while the 3Xi took 280 ms to perform the same tasks. Throughput, which is critical for smooth video and animation playback, was also impressive: The 6PleX's throughput of 829 kbps left the 3Xi's 437 kbps in the dust, and the 6PleX is well ahead of the rated 600-kbps throughput of most 4X models.

The external 6PleX is well designed, with a rugged chassis, easy-to-reach controls, and rubberized feet that keep the chassis from slipping during load/unload drills. As mentioned, the 6PleX is compliant with the Plug and Play (PnP) spec, which means that Microsoft's new *Windows 95* operating system can automatically detect and

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configure the player during installation—provided your MPC itself supports PnP.

The 6PleX uses a caddy-fed mechanism that protects the player's internal mechanisms and optics from dirt. You have to place a disc in the caddy before you can play it, of course, and then insert the caddy in the drive—a bit more work than loading tray-fed players. Unfortunately, the door on the 6PleX doesn't lock when folded down, so inserting a disc is a two-hand job. And the eject mechanism on the 6PleX literally fires the caddy out the door



### Plextor 6PleX

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•

#### EASE OF USE

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#### PERFORMANCE

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#### VALUE

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handy, perhaps, if you're especially coordinated (and in a hurry), but inviting damage otherwise.

The external version comes with a half-length SCSI adaptor card, a connector cable, one disc caddy, and customized driver software for controlling the unit. The internal unit adds brackets for mounting the half-height player in a 5.5-inch drive bay. Though Plextor's driver software and documentation are well executed, installing a CD-ROM

player is still among the most difficult upgrades you can attempt to perform. (It always pays to use a diagnostic utility to find out what resources are available before installation.)

In any case, Plextor's 6PleX is quick, reliable, and well built. And while it's fairly expensive, it's among the best models you can buy. If you need top-notch performance, the Plextor 6PleX is an excellent choice.

—Michael Desmond

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## NEW TECH

**1 IOMEGA** says their Jaz removable drive is the ideal solution for storing, transporting, and playing multimedia applications at home or on the go. The Jaz, which is available in external (2 pounds; \$599) or internal (\$499) configurations, accepts a 3.5-inch disc with either 1-GB or 540-MB capacity. Specs include a 12-ms average seek time, 17.5-ms average access time, 256-kB read/write cache, 6.73-MB-per-second sustained transfer rate, and 10-MBps synchronous SCSI transfer rate—fast enough, Iomega says, to deliver acceptable full-screen full-motion video. The Jaz plugs into a standard SCSI port and is compatible with *Windows 3.1*, *Windows 95*, *Macintosh*, and *OS/2* operating systems. **2 PACKARD BELL**'s P133 Corner Computer (\$2,900, monitor not included) features the Fast Media Key, which offers pushbutton access to the MPC's built-in TV, phone, and radio applications. The TV feature allows users to view images from any video source; video images can be viewed in a PIP-like window while you're working within another application. The hands-free phone includes a call-answering function. The FM radio has 24 memory positions for favorite stations as well as scan and seek controls. These applications can also be controlled via the supplied wireless remote. The P133 is configured with a 133-MHz Pentium processor, 16 MB of RAM, a 2.1-GB hard drive, a quad-speed CD-ROM player, and a 28.8-kbps fax/modem. **3 TOSHIBA**'s

HC-1200A video printer (\$995) is said to offer high-resolution dye-sublimation printing at an affordable price. The 1200A, which is roughly the size of a telephone answering machine, is said to output a photo-quality 4.2 x 3.2-inch print in 80 seconds or less. Full-page images and/or 4- or 16-split multiscreen images can be printed on a single sheet. Equipped with a special thermal printing head, the 1200A has a palette of more than 16.7 million colors and resolution of 142 dpi. Its composite and S-Video inputs accept NTSC signals, and it's equipped with a composite video output for connection to another video source, such as a monitor, VCR, or another printer. A wired remote control is supplied. Printer media costs 70 cents per sheet. **4 PANASONIC**'s Panamedia 15 15-inch computer monitor (\$599) uses the company's Dome Speaker technology to pack stereo speakers and a microphone into its 15.1 x 14.7 x 16-inch (h/w/d) chassis. The 15 features a 0.27-millimeter dot pitch, 1,280 x 1,024 resolution, and an anti-static, -glare, and -reflection coating. Icon-based displays can be set to one of five languages, and two industry-standard color-temperature settings are on tap via the PanaColor control system. The Panamedia 15 conforms to VGA, SVGA, XGA, and MAC standards. ■

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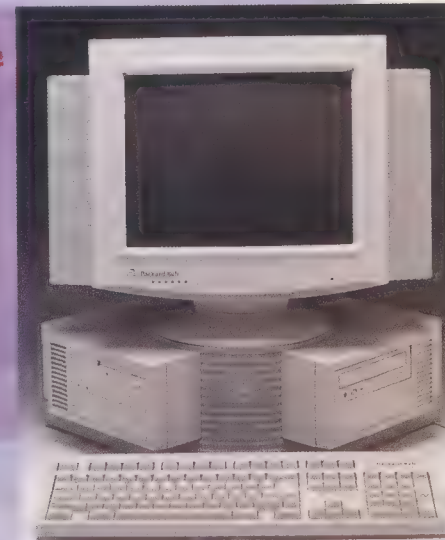
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## SOFTWARE

### WITH OPEN EYES Images From the Art Institute of Chicago

**V**OYAGER'S GORGEOUS *WITH OPEN EYES: Images From the Art Institute of Chicago* (\$40) is an eye-popper: Culled from the institution's impressive fine-art collection, *Eyes* features over 200 pieces of art, including ancient sculpture, Italian Renaissance-era paintings, and works from the usual modern-art suspects (Van Gogh, Picasso, Matisse, Cézanne, Man Ray, *et al*) right on up to a 1987 offering from Buzz Specter. Each piece of artwork is presented full-frame, with designated areas that can be enlarged for a closer look at the brushstrokes or color detail. And don't worry about being stuck in 2-D when it comes to the sculpture—you



Picasso's *The Red Armchair* (1931)

can move a full 360 degrees around the object to view it from a variety of angles. A timeline locates each work in its historical context, enabling the collection to be broken down into 50-year periods. The works can be grouped geographically, too, by clicking on specific world-map locales. And if you *really* like what you see, you can click on a camera icon and take "snapshots," which will delegate each shot to a personalized, temporary scrapbook. The *Eyes* have it. (Mac/Windows disc)

—Josef Krebs

### FULL THROTTLE

**R**UMBLING TO LIFE WITH ALL OF THE impact of straight pipes on a fully chopped Harley, LucasArts' *Full Throttle* (\$50) is part cartoon, part action/ad-

venture game. Unlike many hybrid presentations, however, *Throttle* integrates the best elements from both worlds. Players assume the role of Ben, the principled leader of the Polecats motorcycle gang who awakens unceremoniously inside a dumpster and sets out to thwart the evil intentions of one Adrian Ripburger, a sleazy VP for the all-powerful Corley Motors. Ripburger's plan is to modify his company's manufacturing plant so it cranks out yuppie minivans instead of two-wheeled hogs. (And, while he's at it, he frames Ben and the Polecats for murder.) Ben, meanwhile, has to do battle with members of three other biker gangs. Simple mouse commands make the action easy to control, even for neophyte gamers.

A major key to *Throttle*'s success is its shrewd use of vocal talent. Ripburger's voice is provided by *Star Wars* alum Mark Hamill, while the other actors create fully developed characters that help bring the game up to a level of professionalism that's seldom seen in an interactive title. As far as the actual gaming goes, brains *and* brawn will have to be put to use if you want to move past *Throttle*'s early levels. The only knock is that experienced gamers may only need about 15 hours to get through it all, but, even so, those hours are guaranteed to go by at, well, full throttle. (MPC disc)

—James K. Willcox

### HAIGHT-ASHBURY IN THE SIXTIES

**O**N THE SURFACE, IT SEEMS somewhat ironic that the low-tech, back-to-nature hippie era would eventually find a suitable home in CD-ROM Land. Then again, psychedelia achieved its purest forms of expression with wild music, day-glo posters, and swirling lightshows, and all of these elements suit the multimedia aesthetic like a lava lamp complements a crash pad. These and other heady concepts can be found on the two-disc *Haight-Ashbury in the Sixties* (\$50), from Compton's New Media. The first disc is devoted mainly to a lengthy interactive documentary by Allen Cohen, founding editor of *The San Francisco Oracle*, an alternative

newspaper, and the second disc features an on-screen boardgame where players collect points in order to achieve "the elusive goal of enlightenment." But choose your path with care, brothers and sisters—Monopoly-like playing cards penalize cyber-hippies for such misdeeds as waking up naked in Golden Gate Park. (Bummer.) Overall, the *Haight* experience is a cool way to turn on, tune in, and ROM out. (Mac/Windows disc)

—Ken Korman

### MYTHOLOGY An Introduction to Greek & Roman Mythology

**T**HE IMPACT AND INFLUENCE OF mythology can be found scattered throughout the history of art, literature, and music, and it has passed on important life lessons and insights into the human psyche along the way. And while *Mythology: An Introduction to Greek & Roman Mythology* (\$198; available only from Thomas S. Klise Company, 212.627.4099) serves mainly as a school-level introduction to the lore of the early Greeks and Romans, adults will find that it offers an intriguing way to gain a foothold on this broad and fascinating subject.

*Mythology*'s design is fairly simple. You can jump back and forth between four main topic headings and their respective subsections; each subsection is an illustrated chapter that can either be listened to or read as hypertext. The hypertext offers even greater depth on the subject at hand, and "hot" words (like ARISTOCRATIC) will be defined the moment you click on them. (A full glossary of terms can be accessed at any time.) Accompanying illustrations are a mix of historical artworks and utilitarian drawings. You can either sit back and watch *Mythology* unfold like a documentary, or stop the proceedings and access explanations for anything you don't understand. There are also a number of games to play and tests to take to see how well you're absorbing the information. Personally, I found these last two options invaluable in fueling my learning curve—and that's no myth. (MPC, Mac discs)

—JK



# DIGITAL

CONTINUED FROM PAGE 20

(TOC) information. A disc's TOC is written three times at fixed points in the IGA of each layer (three times for a single-layer disc, six times for a dual-layer disc). The key is that the TOC is stored in the main data channel—not in a sub-code area, as it is with the music CDs. In fact, MMCD doesn't employ a sub-code channel, leading to a modicum of space savings.

The TOC for a single sector accommodates 100 tracks, but additional TOC sectors can be added to accommodate up to a whopping 65,536 tracks. Track 0 contains an ISO 9660 Directory Structure, which allows MMCD players built for CD-ROM playback to access a disc's contents computer-style. The bottom line: More flexibility for more varied applications, and faster data access.

**Disc Manufacturing.** Single-layer MMCDs can be manufactured using traditional CD manufacturing techniques. But the manufacture of dual-

layer MMCDs requires a number of additional steps. Sony claims that they shouldn't significantly affect disc reliability or pricing, however.

With dual-layer MMCDs, the pit pattern of the "bottom" information layer (layer 1) is replicated onto the disc's polycarbonate substrate with a metal stamper. Next, a layer that's 20- to 40-percent reflective and has a thickness of 0.1  $\mu\text{m}$  is sputtered onto the substrate. Then liquid resin is applied to this semi-reflective layer, and the pit pattern of the "top" information layer (layer 0) is pressed onto the liquid resin with a second stamper. The resin is hardened by UV radiation, using a 2P (Photo Polymerization) process. Then a fully reflective aluminum layer is sputtered onto the second layer. Another UV resin is applied to form a protective top layer, and a label is printed across the top side. Reportedly, manufacturing tolerances for MMCDs are said to be twice that of the CD—in other words, it's crucial for the manufacturing plants to come much closer to the ideal every time they "press" an MMCD. But this should be well within the grasp of existing CD plants.

THOUGH WE KNOW THAT THERE HAVE been secret talks between Sony/Philips and Toshiba/Time Warner, no one really knows what's happening at the top levels—"above the clouds," as they say in Japan. Reportedly, the two camps have discussed the possibility of combination DVD players that'd play both MMCDs and SDs. That's great, since it'd remove the risk of buying into a format that might prove short-lived—but it's not so great, since it'd mean that we'd have to pay extra for a player that has that flexibility. Clearly, if the formats are similar enough to allow this type of "combi" player, they're sure as hell similar enough to be merged into a common format.

The situation is tense, and there's a heaviness in the air. We know the quake is coming, but who can say how it will shake out? Based on the available facts, though, one thing is clear: DVD has the technical potential to rock your world. Here's hoping that the complexities of MPEG-2 coding and DVD manufacturing—not to mention industry politics and corporate pride—don't get in the way of achieving every bit of that potential.

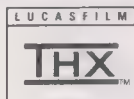
—Ken C. Pohlmann

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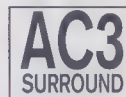
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# WIDE SCENE

CONTINUED FROM PAGE 39

install the extra-wide 2.66:1 screen required by CinemaScope.

To insure that *The Robe* could be played by local operators who lacked an appropriately big screen, the film (like *The Big Trail* before it) was shot two ways: in anamorphic CinemaScope and also in a regular (or "flat") 1.33:1 version, which would fit on virtually all existing screens. The process of shooting films two ways lasted all of 2 years, when it became technically feasible to adjust 'Scope's 2.35:1 ratio to the 1.85:1 standard simply by masking the top and bottom of the frame with black borders.

The two-version approach was fraught with problems of the time and money kind. *Carousel* (1956), which was shot in large-format CinemaScope 55, was concurrently lensed in regular 35MM CinemaScope—causing Frank Sinatra, the film's original star, to walk off the set rather than perform in two movies for the price of one. This may not be as unreasonable as it sounds—director Douglas Sirk told me that *Sign of the Pagan* (1954), which he shot in both CinemaScope and "flat," was indeed two entirely different movies, as the flat version used many alternate compositions more suitable to 1.33:1. (He preferred the 2.35:1 edition, which, sadly, appears to be lost.)

Anthony Mann's *Thunder Bay* (1953), the first Golden Ratio title to successfully go into general distribution, ultimately begat a calamitous fate for every subsequent non-CinemaScope picture released to television or home video. Designed to be shown in theaters with a hard 1.85:1 matte, the full-frame versions of these films frequently reveal boom mics and cables when shown without the matte (or with poor matting).

Spin a 1.85:1 letterboxed laserdisc, for example, and you may occasionally see action bleeding through the top and bottom borders. This doesn't mean that you're missing part of the intended frame. To the contrary, you're seeing exactly what the film's director wanted you to see—but the matte that was inserted during the transfer to laserdisc (which mimics the theater's hard matte) sometimes fails to deliver the opaque-

ness required to completely frame the image.

Other conversions altered a director's vision, managing to anger more than a few filmmakers. Howard Hughes' SuperScope was a 2.1:1 (and, later, 2.35:1) process whose anamorphic squeeze was performed entirely in the lab; it was used from 1954 through 1958 and enraged a number of famous directors. Robert Aldrich's 1.33:1 *Vera Cruz* (1953) was released in 2.1:1 SuperScope, and this not only soured Aldrich on CinemaScope in general, but damaged his relationship with *Vera Cruz* producer/star Burt Lancaster; they wouldn't work together again for almost 20 years. Fritz Lang's 1.85:1 *While the City Sleeps* (1956) was given similar treatment; when asked about his American 'Scope pictures, Lang would bark, "I only made one CinemaScope picture and that was *Moonfleet!*" (1955). On the other hand, when directors intentionally composed their images for the SuperScope process—think Don Siegel's original, 1956 *Invasion of the Body Snatchers*—the results were just fine.

## ISN'T IT SEMANTIC

Later processes mainly borrowed from their more illustrious predecessors. TechniScope, which was launched in the U.S. in 1961 and remained popular through the mid-'70s, was a 2.35:1 anamorphic phenomenon that deserves special mention due to its frugality. Since images were captured on a frame that was half the size of a standard 35MM frame, stock cost was cut by 50 percent—a great incentive for low-budget filmmakers looking to enhance their movies with big-budget results. TechniScope's truest supporters were the Europeans, however, who embraced its somewhat surprising razor-sharp quality. Sergio Leone's "Dollar" flicks (1964–1968), starring Clint Eastwood, and *Once Upon a Time in the West* (1969) were shot in TechniScope. State-side, Universal's *Texas Across the River* (1966) and *Rough Night in Jericho* (1967) used the process to gorgeous ends. Still, it was eventually replaced by Super 35, yet another anamorphic CinemaScope derivative.

A techno/semantic hybrid of SuperScope 2.35 and TechniScope (1985's *Silverado*, an early offering, carried the logo "Super TechniScope"), Super 35 is the contemporary process of choice for many directors, who, unlike their pre-



deprocessors, are compelled to contend with TV and home video. Super 35's many perks include the "20/80 split," which allows the director to compose for 2.35:1 anamorphic projection with an additional 20 percent of height above the frame and 80 percent below. This flexibility gives directors and cinematographers enough leeway to compose images that'll also look good on the 1.33:1 screen of a conventional TV.

While purists insist that theatrical 'Scope movies be released only in their original aspect ratio, videophiles are often given a choice. Director James Cameron, a strong advocate of Super 35, always frames for 2.35:1 theatrical, but fervently creates a home-video version that varies from 1.33:1 to 1.75:1. (The laserdiscs of his *The Abyss* [1989], *Terminator 2: Judgment Day* [1991], and *True Lies* [1994] have been released both ways.) Martin Scorsese, who shot *Cape Fear* (1991) in Panavision, toiled over the pan-and-scan version; when he tackled *Age of Innocence* (1993) 2 years later, he opted for Super 35. (Scorsese told me he was pleased with both the 2.35:1 and 1.33:1 versions of *Fear*.) The Merchant-Ivory team

likewise prefers Super 35, lensing *Howards End* (1992) and *The Remains of the Day* (1993) with it; Columbia TriStar has generously released the *The Age of Innocence* and the Merchant-Ivory lasers in 2.35:1 only.

KEEP THE FILM-PROCESS TIMELINE in mind when you search out widescreen classics. I'm frequently asked if early classics like *Casablanca* (1943), *Citizen Kane* (1941), or *Gone With the Wind* (1939) are available in letterboxed versions, and such queries really aren't as naive as they may seem. During widescreen's '50s heyday, many older studio champs (like *Gone With the Wind* and 1939's *The Wizard of Oz*) were in fact reissued as widescreen productions. These movies were never meant to be seen that way, of course, and consequently suffered the ultimate insult of having the tops and bottoms of their carefully composed frames systematically lopped off. Mercifully, none of these collectibles have surfaced in their cropped, mutated versions on home video... though the Christmas reissue season is upon us. In Hollywood, anything's possible. ■

# VIDEOTEST

## Canon ES2000

CONTINUED FROM PAGE 73

reverse) let you see and line up recently shot footage while remaining in the record-pause mode.

A line-in record button is located just below the tally/sensor; it converts the RCA (and S-Video) output jacks to inputs, so you can receive video from an outside source, such as a VCR. Other connections include an S-Video port, RCA stereo output jacks, DC output for an optional RF adaptor, and a LANC remote terminal. All of these connections are hidden by a rubber cover on the back of the camcorder.

The backlight-compensation button must be held as long as you want it to operate. For sheer ease of use, I preferred using FlexiZone for backlight compensation, since it can maintain its setting once you've triggered it. This helps when you stretch a shot for more than a few seconds.

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Picture performance from the 0.25-inch, 410,000-pixel CCD was good at the lone SP speed. Recorded horizontal resolution was 390 lines, and color rendition was accurate. Though I've seen better Hi8 pictures, the ES2000 still performed very well. One weakness worth noting is that it tended to wash out light colors slightly when I was using the full-auto setting to shoot in bright sunlight. (Note that you can help address this problem with an inexpensive neutral-density filter.) The ES2000 also showed some luminance noise with shots made under lower light conditions, so an optional video light would be a logical accessory.

The ES2000 is equipped with a stereo electret-condenser microphone and AFM stereo Hi-Fi playback, and audio performance was average for the format. Some transport and zoom noise made it to my tapes when I used the built-in mic; fortunately, using the external-mic jack (and an external mic) eliminated the problem. Though there's no accessory shoe on the camcorder to anchor an external mic (or a light, for that matter), adaptors that hold one or the other are readily available.

SERIOUS VIDEOGRAPHERS WHO DEMAND an exceptional degree of control over focus, exposure, and zoom, but don't want to sacrifice high-end perks like optical image stabilization and a color viewfinder, may find that the Canon ES2000 is their best bet, period. You can get marginally better video and audio performance from other Hi8 models in its price class, but no other cam can match the one-two punch of the ES2000's FlexiZone system and its 20X optical zoom. Together, they take this camcorder into the upper echelon of Hi8 models.



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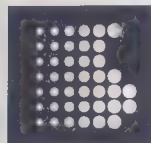
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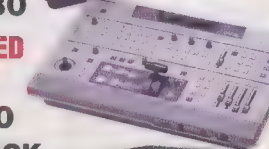
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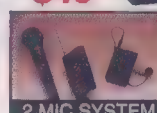
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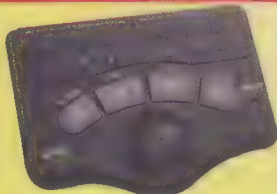
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PV-IQ405	559.99
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PV-950	519.99
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PV-760B	779.99
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## PROFESSIONAL INDUSTRIAL LINE

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AG-188	549.99
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<b>VCRS</b>	
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AG-5700	1174.99
AG-1970	1149.99
AG-1290	209.99
AG-1300	CALL
WJ-MX50	CALL
WJ-MX30	1744.99
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WJ-AV5	769.99
WJ-TTL7	259.99
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GR-S29	CALL
GR-AX 700	519.99
GR-AX 800	584.99
GR-AX 350	519.99
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SR-S360 Super VHS VCR	CALL
BR-S378U Super VHS VCR	CALL
TM-900 SU Monitor	CALL
TM-9U Monitor	CALL
TM-130 SU Monitor	CALL

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 VL-H400U.....\$299.99 VL-E32U.....\$89.99

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## Canon



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 PRO 932.....CALL CC-616.....CALL

## Nikon



VN-400

# VIDEO

Reader Service Card

Please circle product numbers to receive desired information

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165
166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195

- What size is your primary viewing TV?  
 A ☐ 20"-25" B ☐ 25"-27" C ☐ 27"-32" D ☐ 35"+
- Approximately how many hours per day do you watch TV?  
 E ☐ 0-2 F ☐ 3-5 G ☐ 6-10
- How far in advance do you plan your TV viewing?  
 H ☐ 1 hour I ☐ 1 day J ☐ 1 week K ☐ No Planning
- Do you tape "series" programming (i.e. soap operas, mini-series)?  
 L ☐ Yes M ☐ No
- Which sources do you use to plan TV viewing?  
 N ☐ Daily Newspaper O ☐ Cable Guide P ☐ Weekly Newspaper Insert  
 Q ☐ TV Guide R ☐ Other
- How many programs do you tape per week?  
 S ☐ 1-5 T ☐ 5-7 U ☐ 7+
- If programming your VCR was made easier would you record additional shows? V ☐ Yes W ☐ No
- Are you currently a subscriber to VIDEO? X ☐ Yes Y ☐ No

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 (please print)

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone Number (with Area Code) \_\_\_\_\_

Allow 6-8 weeks for delivery. Card expires 1/31/96 VM10951

# VIDEO

Reader Service Card

Please circle product numbers to receive desired information

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165
166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195

- What size is your primary viewing TV?  
 A ☐ 20"-25" B ☐ 25"-27" C ☐ 27"-32" D ☐ 35"+
- Approximately how many hours per day do you watch TV?  
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- How far in advance do you plan your TV viewing?  
 H ☐ 1 hour I ☐ 1 day J ☐ 1 week K ☐ No Planning
- Do you tape "series" programming (i.e. soap operas, mini-series)?  
 L ☐ Yes M ☐ No
- Which sources do you use to plan TV viewing?  
 N ☐ Daily Newspaper O ☐ Cable Guide P ☐ Weekly Newspaper Insert  
 Q ☐ TV Guide R ☐ Other
- How many programs do you tape per week?  
 S ☐ 1-5 T ☐ 5-7 U ☐ 7+
- If programming your VCR was made easier would you record additional shows? V ☐ Yes W ☐ No
- Are you currently a subscriber to VIDEO? X ☐ Yes Y ☐ No

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PV-940	469.99		
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PV-S770	919.99		

H-8MM COLOR VIEWFINDER, IMAGE STABILIZATION, RC TIME CODE

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AG-455	CALL
AG-196	CALL
AG-195	889.99
AG-168	549.99
AG-167	499.99
AG-3	2099.99
AG-DP800 3 Chip Supercam	CALL
VCRS	
AG-W1	1499.99
AG-5700	1174.99
AG-1970	1149.99
AG-1290	209.99
AG-1300	CALL
WJ-MX50	CALL
WJ-MX30	1744.99
WJ-AV7	839.99
WJ-AV5	769.99
WJ-TTL7	259.99
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NEWGV 30D50 ..... CALL  
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CT-W604R ..... 129.99  
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# THE ELECTRONIC MAILBOX

THE VIDEO EDITING & PRODUCTION EXPERTS



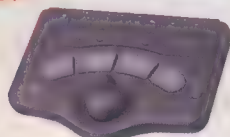
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New!



## JXED-11 The World's Easiest Editor!

If you can press a button, you can edit a video! New JVC editor is completely wireless-IR remote controlled! Exclusive Jog Locator Dial helps locate & rearrange scenes. No hook-up. Edit anywhere, anytime! Works with all formats inc. S-VHS & Hi8. **\$99<sup>95</sup>**



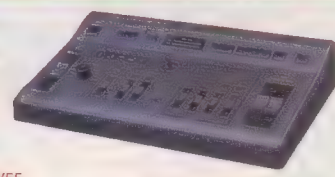
## JXT66 Compact Video Titler

The lowest priced titler ever offered! Features 4 type sizes, 8 page memory, scroll and zoom in/out. Plus, it works with all formats including S-VHS! AC/DC **SALE \$99<sup>95</sup>** (reg \$119<sup>00</sup>)



## JXT88 S-VHS/Hi8 Color Titler

The world's easiest to use color titler! Generates its own title screens for quick & easy title creation. • 8 colors/4 sizes • 10 pgs memory • Fade in/out & Scroll title • Standard size keypad **SALE \$199<sup>00</sup>** (reg \$229<sup>00</sup>)



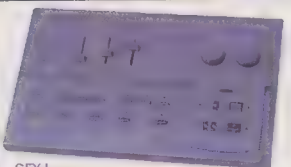
## JXSV55 Ultimate S-VHS Production Center

The only production center that combines:  
• SPECIAL EFFECTS GENERATOR  
• HI FI STEREO AUDIO MIXER  
• SVHS COLOR PROCESSOR all in one easy to use unit!  
Also Available:  
JXS300 Remote Control S-VHS A/V Switcher (3in/3out) **\$249<sup>00</sup>**  
JXS700 Deluxe Remote Control S-VHS A/V Switcher (7in/4out) with 960 lines resolution & 2 signal paths. **\$499<sup>00</sup>**



## Universal Editor Works With ALL VCRs!!!

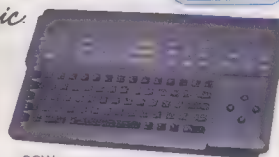
Automatic Infra-Red Editor lets you perform glitch free straight cuts or fade to black between scenes. Dual IR control of both playback & record deck makes editing a breeze. Built in audio mixer. **\$99<sup>95</sup>** (reg \$149<sup>00</sup>)



## SFX-L Automatic Control L Editor & Special Effects Generator

The SFX-L automatically edits your home videos with color fades & wipes plus audio mixing. Preprogram an Edit Decision List with up to 23 scenes. The on-screen display lists the in & out points, transition choices (cut, fade or wipe) & elapsed time of your video. Requires Sony or equivalent Control L camcorder. Complete with mic & cables. S-VHS/Hi8 compatible. **SALE \$199<sup>00</sup>** (reg \$299<sup>00</sup>)

## ColorWriter Magic



## SCW Full Color Electronic Titler w/ Special Title Effects

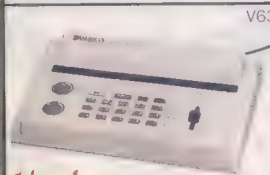
Put your titles into motion & create unique Hollywood effects. Features deluxe full size keyboard, S-VHS & Hi8 compatibility, & 12 page memory. Letter choices include 8 colors, 4 sizes, outlining & boxing. **SALE \$199<sup>00</sup>** (reg \$229<sup>00</sup>)



## VideoPro Magic

Professional  
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Generator  
SFX5

- Picture-in-picture Combine 2 video sources by adding full motion or still PIP
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- Strobe High, medium & low speeds
- Multiscreen Display 4 or 9 still frames on one screen, PLUS any 1 frame can be in full motion
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- Paint Dramatic color posterization
- Audio Mixer **SALE \$249<sup>00</sup>** (reg \$299<sup>00</sup>)



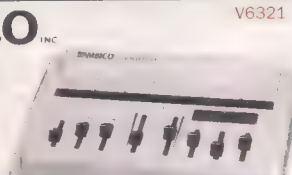
## New! Automatic Editor- Choose & Rearrange up to 191 Scenes

On screen Edit Decision List displays sequences, in & out points & transition choices (fade or cut). Built-in enhancer. Requires Sony Control L or Pana. 5 pin for automatic editing. **\$199<sup>00</sup>**



## Video Titewriter-Deluxe Color Titler

Superimpose titles over live video or on B&W background. Features 8 colors, 2 fonts, 4 sizes & 3 borders. Titles can wipe in/out, scroll up/down, crawl & flash. 10 page memory. **SALE \$149<sup>00</sup>** (reg \$179<sup>00</sup>)



## New! Audio Video Processor

Includes luminance, enhancer & color gain controls for picture improvement. PLUS, DNR to reduce hiss, 3 channel audio mixer with LED level indicators & individual audio & video fade controls. Free headset/boom mic. **\$149<sup>00</sup>**



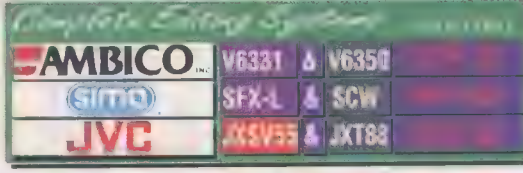
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RB-70UL



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RL-20 compact light



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AP-200W

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### Aver Video Suite

Complete Windows based DTV editing system!

Now includes Video Director 2.5!

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**\$599<sup>00</sup>**

**New!**

### Aver Pro Desk Top Video titling system for Windows.

Top rated Aver Pro overlay card and modified Curtain Call let you superimpose spectacular titles, graphics and transitions over video. Magically transform any font with beautiful effects. Includes over 30 different wipe patterns.

**\$499<sup>00</sup>**

**New!**

### AverKey3 Hi-Resolution Scan Converter

Display VGA output from your computer to any TV or VCR! Provides VGA, composite, SVHS & RGB output with resolutions up to 800x600 & 2nd generation Flicker Free technology. True Plug & Play - no software driver required. Remote control operation lets you zoom & pan to any area of the screen, plus freeze.

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AverKey Mac/PC **\$399<sup>00</sup>**

**New!**

### Movie Machine Pro-Digital Video Mixing, Chroma-Key, & Much More for under \$500!

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Non-linear editing is every editor's dream...random access to any frame you want at lightning speed. FAST's high-quality Motion JPEG compression combined with Adobe Premiere turns your computer into a state-of-the-art non-linear editing system with digital effects at your fingertips and ultra-fast editing in a totally digital environment. Create music videos, highlight films, commercials, animations... anything you can imagine. **Complete system includes the FAST Movie Machine Pro with the Motion JPEG Option, plus these award winning software titles: Adobe Premiere, Autodesk Animator Pro CD & Xing CD MPEG encoder. SALE \$899<sup>00</sup>**

**New!**

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ECZ990

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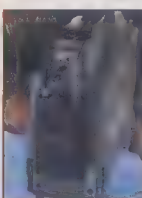
Picks up sound in front without side noises. 2 position zoom/wide. **SALE \$69<sup>95</sup>**

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VG100

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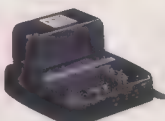
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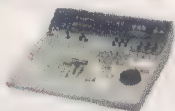


## SONY

SVP-5600 SVO-5800  
FXE-100

### Professional Editing System

The SVP-5600 high quality S-VHS editing player, when combined with the SVO-5800 editing recorder and the FXE-100 edit controller, creates a flexible, cost efficient editing system. Excellent video/audio quality. Built-in TBC and Time Code. 4-Channel audio. Frame accurate editing.



NEW!



## SONY SVO-2000 RM-250 Prosumer Editing System

The SVO-2000 is an easy to use S-VHS Hi-Fi, editing recorder, in combination with the RM-250 editing controller unit. The SVO-2000 creates a simple and cost efficient two machine editing system, providing assemble, video/audio insert and program editing capability.



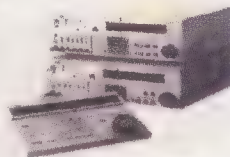
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One Piece Camcorder 3 CCD Camera with Full Size S-VHS Recorder Built-in, Very Low Light, 1 Lux, 13x or 17x Optional Lenses.

## JVC BRS622U/BR822U RMG 860U PROFESSIONAL EDITING SYSTEM

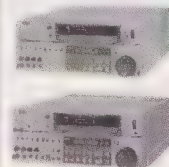
S-VHS Insert and Assemble Editing, 4 Channel Audio, Optional Plug-in Time Code and TBC's, Self Diagnostic Warning System, Automatic Head Cleaning, On Screen Menu Display. Recorder Has Built-in Single Event Recorder.



JVC  
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## EDIT DESK BR-S800U/BR-S500U/RM-G800U

Cost Effective S-VHS Edit System With Time Code, 4 Channel Audio.



Heavy Duty Drive System. 32x Picture Search. Open Architecture for Future Expandability. Hottest System for 1995.

Panasonic



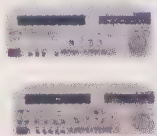
## AG-456U SVHS CAMCORDER

S-VHS Camcorder/Source for Editing, 12x 2 Speed Zoom lens, manual zoom, 24x & 100x Digital Zoom, Digital Special Effects, Wipe, Fade, Mix, Strobe, etc. Special Effects.

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Non - Linear/Linear Computer Based Editing Systems

Panasonic



Advanced Digital S-VHS Editing System, Full Field 3D TBC, 10 Step Digital Slow Motion, DNR, Built-in Time-Code, 16x9 capable, Component Output, Heavy-Duty Tape Transport with 5 motors, 32x Picture Search, 4 Channel Audio, Compact Chassis.



Desktop A/B Roll Editing Controllers. For IBM Compatibles, Mac and Toaster. Supports Entry-Level through Broadcast Equipment. Cut & Paste, Clean, Ripple, Sort and more. CMX File Conversion. Easy-to-use intuitive on-screen controls.

Panasonic



## AG-DP800 S-VHS FIT 3-CCD DIGITAL SIGNAL PROCESSING CAMERA/RECORDER

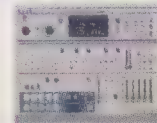
High Sensitivity FIT CCD, Chroma Detail, Built-in Phantom Power, Lightweight/Low Power Consumption 4-Channel Audio, Built-in Time Code Generator

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**Video Editing**

JXS55 JXT88  
JXT66 JXT00

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VR-507 VR-720HF  
VR-503 VR-800HF  
VR-674

## Panasonic



**AG-456**

SVHS-1LUX-12X ZOOM

**AG-1970**

SVHS/VHS AG-1290 CT-1383VW  
AG-513A CT-1384VY  
AG-5700 WJKB15  
AG-520A WJMX30  
AG-A96 WJAVE7  
VW-C65P WJKB15

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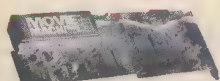
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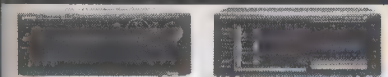
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
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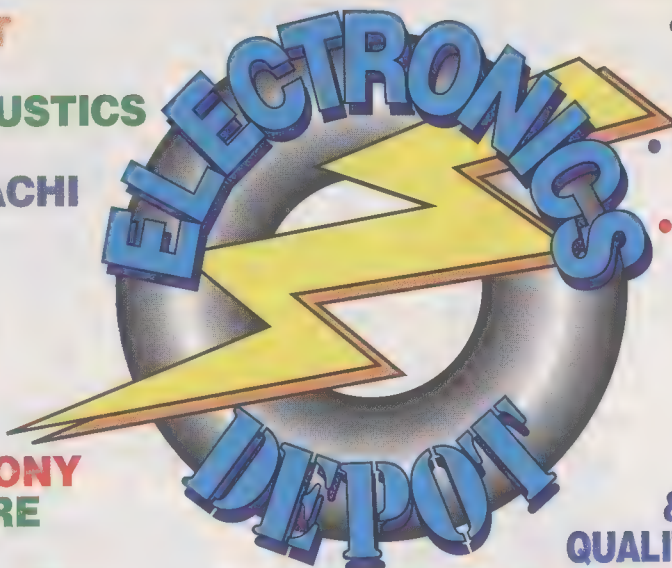
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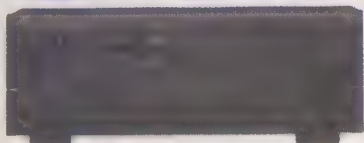
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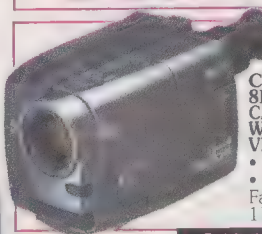
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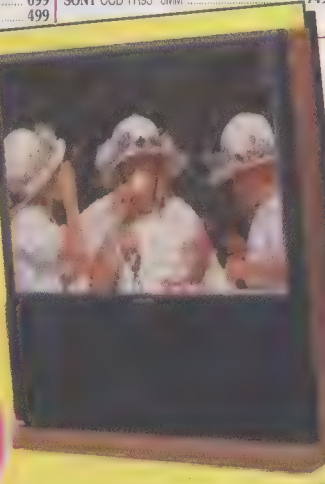
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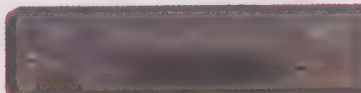
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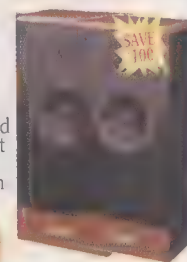
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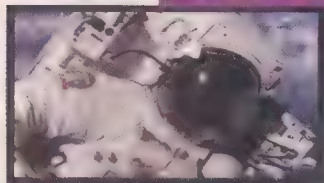
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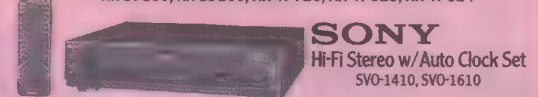
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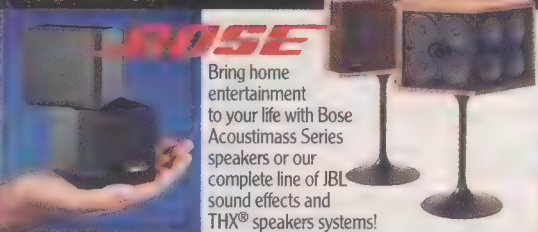
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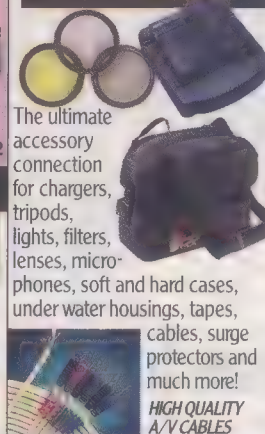


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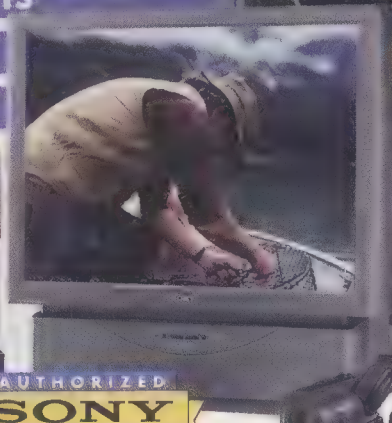
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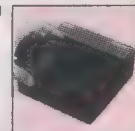
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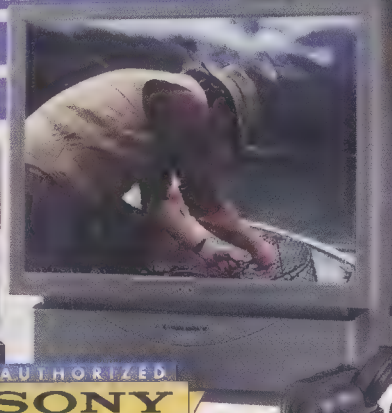
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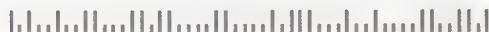
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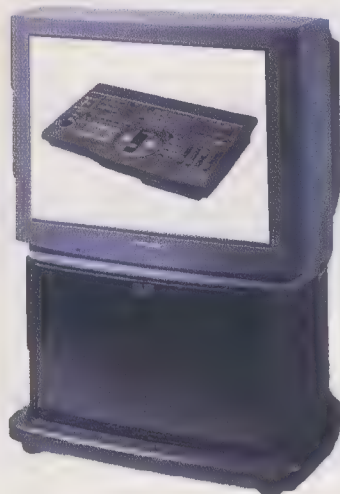
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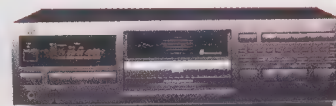
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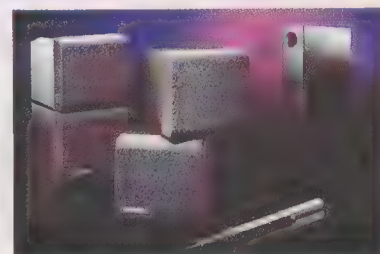
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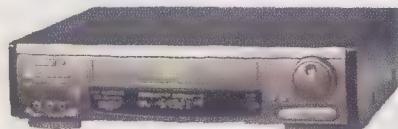
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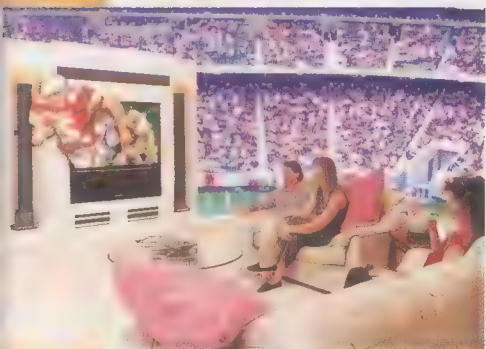


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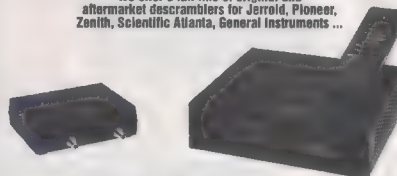
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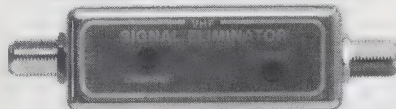
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## Where TV's channel-lock feature fears to tread

# CHIP SHOTS

**W**HEN THE HOUSE JOINED THE SENATE IN PASSING telecommunications legislation last August, the odds seemed very good that one of the bills' more emotional provisions—the V-chip—would become law. Most parents I know like the idea of this electronic watchdog, reasoning that it'll help hound the seamy bits of TV programming off their big-screen and keep our impressionable youngsters from the slick sinkhole of corruption. I know I feel that way, and I look forward to patiently explaining the V-chip's many virtues to my preternaturally mature brood—though not at the dinner table, when sharp objects are likely to be nearby.

They may feel discriminated against, of course, and if you're like me you're probably losing most of the family debates these days. So why stop with the V-chip, which combats only images of violence, rough language, and sexually explicit scenes? Any number of chips could be devised—and mandated, by big-government types—to safeguard innocent viewers everywhere. The S-chip, for example, can block any *Star Trek* episode that doesn't feature Captain Kirk or Captain Picard. The I-chip can deflect infomercials (we can assume that CBS will be blanked for entire Sundays during football season). The F-chip can delete any fast-food commercial that includes disturbing images of ground-beef products or seafood samplers unbalanced by too many varieties of shrimp. The P-chip can mute way-too-perky morning network personalities (sorry, Kathie Lee). The B-chip can eradicate coverage of any Olympic sport that haphazardly combines skis and loaded firearms. And the H-chip can blot out any show in which Pat Hingle is the love interest.

Of course, there will be times when you'll want to switch off the V-chip and just let all of the violence seep through. 1996 is an election year, after all, and the presidential debates promise to be good and bloody. Activate the chip and you'll never see another Indiana basketball game—at least as long as Bobby Knight is coach. And who wants to miss the

carnage as Russell Baker stumbles through his *Masterpiece Theater* introductions?

It occurs to me, though, that we'll be putting ourselves at grave risk if we bring a V-chipped set into the living room: After all, our kids are fully conversant with Game Boys and the Internet years before they even think about getting a driver's license, and they'll figure out the V-chip's mechanics before we can say "political action committee." The next thing you know, you'll be sitting down to watch the tough-love cops on

*NYPD Blue*—and the chip will blank ABC. A few days later, you'll plan your Saturday evening around watching *Walker, Texas Ranger* dance on some bad guy's noggin—and at the appointed hour CBS will have vanished into thin air. And you'll be confronted by nada when you try to watch the gleefully perverse *Tales From the Crypt*, leaving only professional wrestling and (egad!) *Saturday Night Live* on the menu.

The best time to set up a V-chipped TV, then, is when the kids aren't around. If your kids don't naturally put as much



distance between themselves and you as they can, you could loudly announce that it's finally time to clean out the attic, or that it's time for dinner and you've finally perfected that liver carpaccio you read about in *Bon Appetit*. Or you could simply break out your old Rolling Stones records and start singing "Ruby Tuesday."

I guess there are alternatives to buying a new, V-chipped TV, though. You could finally send the kids to study for a year or two in Europe, where they'll learn enough about culture and style and croissants not to care much about vulgar American TV shows. A more prudent course would be to send them to that military academy down the road and use the money you save to buy that 50-inch rear-projector you've been pining for. It'll have a V-chip, of course, but that shouldn't hinder you... unless Senator Hollings has his way, and *all* quote-unquote objectionable programming gets banned until the wee hours. I wonder what a real expert on the subject, like Senator Packwood, has to say about that?

—Bob St. Nice



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